Lessons Learned from the U.S. Unbundling Experience

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I. INTRODUCTION

Prior to 1996, one of the key unresolved issues in telecommunications restructuring was competition over the "last mile"—*i.e.*, that last segment of the network necessary to connect the customer.[1] Although the Federal Communications Commission ("FCC") had opened some monopoly telecommunications markets to entry by the late 1980s (e.g., Customer Premise Equipment ("CPE") and "long distance" services),[2] the Communications Act of 1934[3] still reflected a presumption that local telecommunications markets were natural monopolies subject to regulation by both the FCC and state public utility commissions.[4] Indeed, despite the somewhat regular deployment of state-of-the-art national and regional long-haul networks and metropolitan fiber rings by a number of carriers, the deployment of alternative wireline networks ended when they reached into the local exchange, leaving dominant control of most switching and transport facilities, and particularly the "last mile" of the local exchange network, to the Incumbent Local Exchange Providers or "ILECs."[5]

Frustrated by the lack of local competition, Congress passed the landmark Telecommunications Act of 1996.[6] At the centerpiece of the 1996 Act was the most ambitious regulatory intervention ever attempted: i.e., to stimulate local competition by forcing the ILECs to make unbundled network elements available to competitors at regulated rates.[7] The notion of stimulating facilities-based competition via a mandatory wholesale model was not without precedent, however. In large part, Congress's plan was to replicate the experience of competitive development in the U.S. long-distance market a decade before, where early entrants were permitted to resell the capacity of the then-monopoly long distance carrier AT&T,

1. *Readers' Note:* The "last mile" is a term of reference and is not meant to describe a "measured mile." Instead, the "last mile" can be as small as a few feet or yards. While the "last mile" of the local exchange network is perhaps the most challenging trial for competition policy, the supply-side economics of many other components of the local exchange network, for example switching and transport, also prohibit large numbers competition.

2. Lawrence J. Spiwak, *What Hath Congress Wrought? Reorienting Economic Analysis of Telecommunications Markets After The 1996 Act*, 11 ANTITRUST MAG., Spring at 32, 32 (Spring 1997).

3. Pub. L. 73–416, 48 Stat. 1064 (1934) (codified as amended in Title 47 of the United States Code).

4. *See* Stuart Minor Benjamin *et al.*, TELECOMMUNICATIONS LAW AND POLICY 385 (3d ed. 2012)*; see also* Spiwak, *supra* note 2.

5. *See* AT&T Corp. v. Iowa Util. Bd., 525 U.S. 366, 371 (1999). *Accord* BENJAMIN ET AL., *supra* note 4, at 385-86.

6. Pub. L. No. 104-104, 110 Stat. 56 (1996); *see also* Lawrence J. Spiwak, *The Telecoms Twilight Zone: Navigating the Legal Morass Among the Supreme Court, the D.C. Circuit and the Federal Communications Commission*, PHOENIX CTR. POL. PAPER NO. 13, at 12-13 (2002), http://www.phoenix-center.org/pcpp/PCPP13Final.pdf.

7. *See* 47 U.S.C. § 251 (2012); *see also* Spiwak, *supra* note 2, at 33.

thereby allowing the new firms to offer services ubiquitously.[8] Over time, as the business of the new entrants grew, these new competitors would construct their own networks and move away from resale.[9] Following this "stepping stone" theme, the 1996 Act required, among other things, the ILECs to unbundle various components of their local networks and make them available to potential competitors, thus "sharing" with their competitors the inherent economies of scale built into their ubiquitous local networks.[10]

As a result of the 1996 Act, financial resources poured into the communications industry at a frenzied pace.[11] In the fifteen years preceding the 1996 Act, the capital stock of telecommunications firms grew on average at an annual rate of 3.0%. In the few years after the 1996 Act, the annual average increase in telecommunications capital stock was 7.9%.[12] In the five years following the passage of the Act, the U.S. capital stock in telecommunications plant was $194 billion above trend, or about 36% above the forecast level.[13] The increase in capital expenditures in the communications industry actually began in 1994, at which time a sizeable equity bubble began to inflate in the U.S. economy.[14] Part of the rise in capital investment can be attributed this bubble, which burst in the Spring of 2001, and a vigorous decline in industry investment immediately followed.[15] Nevertheless, by 2004, Competitive Local Exchange Carriers ("CLECS") would be serving about 20 million of their 33 million access lines (about

8. *See* Spiwak, *The Telecoms Twilight Zone*, *supra* note 6, at 14.

9. *See id.* at 17.

10. *See* 47 U.S.C. § 251. Shortly after the 1996 Act was signed, other advanced economies would develop unbundling regimes of their own. *See* OECD WORKING PARTY ON TELECOMM. & INFO. SERVS. POLICIES, DEVELOPMENTS IN LOCAL LOOP UNBUNDLING 16 tbl. 1 (2003), http://www.oecd.org/sti/6869228.pdf. For a timeline of major telecommunications reforms, *see id.* United States representatives, through such vehicles as the World Trade Organization ("WTO"), aggressively encouraged other countries to implement unbundling policies of their own. P. Griffin, *Moore Pitches in for Unbundling of Phone Network*, NEW ZEALAND HERALD (Apr. 28, 2004), http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid= 3563080; *see also* MARK NAFTEL & LAWRENCE J. SPIWAK, THE TELECOMS TRADE WAR: THE UNITED STATES, THE EUROPEAN UNION AND THE WORLD TRADE ORGANIZATION (2001).

11. *The Truth About Telecommunications Investment after the Telecommunications Act of 1996*, Phoenix Center Pol. Bulletin No. 4, at 2, 5 (June 24, 2003), http://www.phoenix-center.org/PolicyBulletin/PolicyBulletin4Final.pdf.

12. *Id.*

13. *Id.*

14. *See* Alen Mattich, *Investors Should Remember 1994*, WALL ST. J. (Dec. 29, 2010), http://blogs. wsj.com/ source/2010/12/29/remembering-1994/.

15. Elise A. Couper et al., *Boom and Bust in Telecommunications*, 89 FED. RES. BANK OF RICH. ECON. Q. 4, at 1-2 (2003).

20% of the total market) using unbundled elements made available by the rules implementing the 1996 Act.[16]

Despite this initial success, via a series of orders by the FCC and court decisions, the scale and scope of the 1996 Act's unbundling regime was increasingly narrowed, culminating in the FCC's *Triennial Review Order*[17] in 2005 that effectively rendered most business plans based on unbundled network elements financially unviable. After that, the effort to stimulate local telecommunications competition via unbundled elements came to a screeching halt. Indeed, from 2004 to 2010, the number of lines serviced using unbundled elements would fall nearly 90% from a peak of about 21 million to only 3 million lines, largely due to the elimination of the unbundled switching element which serviced most of the competitive lines.[18] The decline continues: over the last three years for which data is available (2007-2010), the number of access lines served using unbundled elements has declined at a rate of 22% annually.[19] By the end of 2010, unbundled switching was all but gone, with competitive lines served using the switching element falling from about 17 million in 2004 to only 53,000 lines at the end 2010.[20] With mixed success, the ILECs have requested grants of forbearance from their unbundling obligations, drawing ever nearer the official end of the unbundling experiment in the United States.[21] As to be expected, most of the competitive carriers who relied on the unbundling regime—including the long-distance telecommunications behemoths AT&T and MCI—are now

16. *See* FCC WIRELINE COMPETITION BUREAU, LOCAL TELEPHONE COMPETITION: STATUS AS OF DEC. 31, 2007 tbl. 2-4 (2008), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-285509A1.pdf.

17. *See* Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, and Deployment of Wireline Services Offering Advanced Telecommunications Capability, *Report and Order and Order on Remand and Further Notice of Proposed Rulemaking*, 18 FCC Rcd 16978 para. 7 (2003) [hereinafter *Triennial Review Order*].

18. FCC WIRELINE COMPETITION BUREAU, LOCAL TELEPHONE COMPETITION: STATUS AS OF DEC. 31, 2013 (2014) https://apps.fcc.gov/edocs_public/attachmatch/DOC-329975A1.pdf.

19. *See id*.

20. *See id*.

21. *See* Petition to Establish Procedural Requirements to Govern Proceedings for Forbearance Under Section 10 of the Communications Act of 1934, *Report & Order*, 24 FCC Rcd 9543 (rel. June 29, 2009); *see also* Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Phoenix, Arizona Metropolitan Statistical Area, *Memorandum Opinion And Order*, 25 FCC Rcd 8622 (rel. June 22, 2010). *But c.f.* G.S. Ford & L.J. Spiwak, *The Impossible Dream: Forbearance After the Phoenix Order*, PHOENIX CTR. PERSPECTIVE NO. 10-08 (2010), http://www.phoenix-center.org/perspectives/Perspective10-08Final.pdf; G.S. Ford & L.J. Spiwak, *Section 10 Forbearance: Asking The Right Questions To Get The Right Answers*, 23 COMMLAW CONSPECTUS 126 (2014).

gone, some dying quickly, some slowly, and some eventually acquired by the ILECs.[22]

Yet, despite the failure of the unbundling paradigm mandated by the 1996 Act, the world did not end. Quite to the contrary, competition in the United States is nonetheless thriving due to new technologies totally unforeseen in 1996. As lines served by unbundled elements declined, the total number of lines served by competitors would soon begin to grow again and eventually skyrocket to over 50 million landlines (by recent measure), with the growth coming mostly from the commercial emergence of Voice-over-Internet-Protocol technology ("VoIP"), which permitted voice services to be provided over broadband Internet connections.[23] Local competition in the United States, it turns out, was not the result of new entrants constructing new plant, but from the repurposing of the embedded cable television plant and the migration of many households to the exclusive use of mobile wireless services. Today, between VoIP providers and wireless substitution, the once-dominant ILECs serve fewer than half of all access lines, a decline in market share that few industry analysts thought possible.[24]

Today, the United States' experiment with unbundling is all but over,[25] with only a few clinging to the possibility of an unbundling renaissance.[26] Much modern day support for unbundling networks suffers from a lack of direct experience with its implementation in this country (or else are the residual users of network elements). In this Article, we present a brief summary of the rise and ultimate demise of the United States' experiment

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22. *See, e.g.*, Marguerite Reardon, *SBC Closes AT&T Acquisition*, CNET (Nov. 18, 2015), http://www.cnet.com/news/sbc-closes-at-38t-acquisition; Marguerite Reardon, *Verizon Closes Book on MCI Merger*, CNET (Jan. 6, 2006), http://www.cnet.com/news/verizon-closes-book-on-mci-merger); Press Release, MegaPath, Covad, Speakeasy Merger Closes, (Sept. 1, 2010), http://www.reuters.com/article/idUS160265+01-Sep-2010+BW20100901; Press Release, Trinsic (formerly Z-Tel) Files for Chapter 11 Reorganization (Feb. 8, 2007), http://phx.corporate-ir.net/phoenix.zhtml?c=104231&p=irol-newsArticle&ID=961032.

23. *See infra* Figure 3.

24. *See* Jason Bazinet et al., *Video, Data, & Voice Distribution*, CITI INV. RES. & ANALYSIS (May 13, 2011) ("[t]elco voice declined to around … 43% of all US households"); *see also* FCC, TRENDS IN TELEPHONE SERVICE, tbls. 7.4, 8.1-8.2 (2010) (showing that 24.5% of homes are wireless only, and that non-ILEC end-user switched access lines were about 27% at the end of 2008). The most recent survey by the Center for Disease Control finds that 38.2% of American homes are wireless only households and that 15.9% of households with a wireline phone received most of their calls on a wireless phone (suggesting continued growth in wireless only households). *See* S. Blumberg & J. Luke, *Wireless Substitution: Entry Release of Estimates from the National Health Interview* Survey, July-December 2012, CDC (June 2013), http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201306.pdf.

25. *See, e.g.*, SUSAN P. CRAWFORD, CAPTIVE AUDIENCE: THE TELECOM INDUSTRY AND MONOPOLY POWER IN THE GILDED AGE (Yale University Press 2013); Y. BENKLER, NEXT GENERATION CONNECTIVITY: A REVIEW OF BROADBAND INTERNET TRANSITIONS AND POLICY FROM AROUND THE WORLD, BERKMAN CENTER FOR INTERNET & SOCIETY AT HARVARD UNIVERSITY 1, 85 (2010), http://cyber.law.harvard.edu/sites/cyber.law.harvard.edu/files/Berkman_ Center_ Broadband_Final_Report_15Feb2010.pdf.

26. *But see* G. S. Ford, *Whoops! Berkman Study Shows "Open Access" Reduces Broadband Consumption*, PHOENIX CTR. PERSPECTIVES NO. 09-05, at 1, 2-4 (Nov. 12, 2009), http://www.phoenix-center.org/perspectives/Perspective09-05Final.pdf.

with unbundling. With the benefit of hindsight and extensive experience, we contend that three fundamental defects underlying the United States' unbundling paradigm gave it little prospect for success over the long-term—dooming unbundling nearly from its conception. In so doing, we hope that this Article will provide some guidance to policymakers as they contemplate regulatory interventions across a range of settings.

The formulation and dismantling of unbundling policy in the United States spanned an intense eight years, so our review is by no means exhaustive. We apologize for excluding the discussion of an issue, order, or court decision that the reader may find far more relevant than those we discuss, and we suspect there are many. For those readers with battle scars, we hope this review brings back fond memories of what has to be one of the most exciting periods in the recent history of telecommunications policy.

While it is tempting to place blame on particular regulatory or legal decisions, and even the personalities associated with these decisions, the demise of the unbundling regime in the U.S. was driven (in our view) by three underlying economic causes which policymakers failed to fully comprehend: (a) the expectations of policymakers for competitive "green field" facilities-based entry into the local market were, at the time of the enactment of the 1996 Telecommunications Act, unrealistic; (b) the unbundling regime was incentive incompatible in that the incumbent local phone companies were required to surrender market shares to entrants at regulated prices without any permanent offsetting benefit; and (c) the rise of new alternative distribution technologies such as cable, wireless and over-the-top services that expanded the availability and quality of competing voice services.

Importantly, we make no consumer welfare claims about the desirability of unbundling or its failure. In fact, we pass no judgments on the unbundling regime at all, but merely present what we believe to be the underlying and fundamental economic forces that led to its now trivial role in the development of competition in the United States local telephone market. We do so because we believe these same factors are relevant in a variety of settings, both domestically in the United States and abroad.[27]

To explore these important topics in greater detail, this paper is organized as follows: In Part II, we begin with an overview of the unbundling paradigm and an analysis of the 1996 Act's specific unbundling requirements. In Part III, we look at the economic fundamentals of the local market. In Part IV, we discuss the important concept of how regulation can force firms to engage in "sabotage" (i.e., non-price discrimination). Next, in Part V, we describe the rise of alternative distribution platforms that were not even contemplated when the 1996 Act was enacted nearly twenty years ago. Finally, we present conclusions and policy recommendations in Part VI.

27. *See, e.g.,* G. S. Ford & M. Stern, *Sabotaging Content Competition: Do Proposed Net Neutrality Regulations Promote Exclusion?,* PHOENIX CENTER PERSPECTIVE No. 10-02 1, 2-5 (March 4, 2010), http://www.phoenix-center.org/perspectives/Perspective10-02Final.pdf.

For additional references, Appendix A contains a brief synopsis of the major FCC and court cases adjudicating the unbundling paradigm.

II. REVIEW OF THE 1996 ACT'S UNBUNDLING REQUIREMENTS

A. What Gets Unbundled?

A critical implementation issue for the 1996 Act was: What elements of the network are to be unbundled?[28] Since the purpose of unbundling is to facilitate competition, what elements were to be unbundled was a hotly contested issue, with the CLECs seeking to maximize and the ILECs seeking to minimize the list of unbundled elements.[29] The Telecommunications Act of 1996 required ILECs to provide unbundled network elements or "UNEs" to other telecommunications carriers.[30] In particular, Section 251(c)(3) of the Act states that ILECs have a duty to:

> provide, to any requesting telecommunications carrier for the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory in accordance with the terms and conditions of the agreement and the requirements of this section and section 252.[31]

This section required that ILECs provide such network elements "in a manner that allows requesting carriers to combine such elements in order to provide such telecommunications service."[32] The Act defined the term "network element" as "a facility or equipment used in the provision of a telecommunications service," specifying that "[s]uch term also includes features, functions, and capabilities that are provided by means of such

28. *See* Peter J. Howe, *Baby Bells, Rivals Spar Over Telecommunications Rules*, BOSTON GLOBE, Oct. 14, 2002, at D1.

29. *See* Shira Levine, *The Unending Debate*, AMERICA'S NETWORK, Sept. 15, 2002, at 14; Howe, *supra* note 29, at D5; J.T. Johnson, *ILECs Are Crying Wolf Over Regulation*, NETWORK WORLD, Oct. 14, 2002, at 38; Tim Greene & Michael Martin, *States, RBOCs Battle Over Regulations*, NETWORK WORLD, Nov. 25, 2002, at 14.

30. *See* 47 U.S.C. § 251. Section 153(51) of the Act defines a telecommunications carrier as "any provider of telecommunications services, except that such term does not include aggregators of telecommunications services (as defined in section 226)." 47 U.S.C. § 153(51). Section 153(51) also states that "[a] telecommunications carrier shall be treated as a common carrier under this Act only to the extent that it is engaged in providing telecommunications services, except that the Commission shall determine whether the provision of fixed and mobile satellite service shall be treated as common carriage." *Id.*

31. 47 U.S.C. § 251(c)(3).

32. 47 U.S.C. § 153(53) defines telecommunications service as "the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available to the public, regardless of the facilities used." 47 U.S.C. § 153(53).

facility or equipment, including subscriber numbers, databases, signaling systems, and information sufficient for billing and collection or used in the transmission, routing, or other provisions of a telecommunications service."[33]

The 1996 Act also established a general federal standard for use in determining the UNEs that must be made available by the ILECs pursuant to Section 251[34]. Section 251(d)(2) provides that:

> [i]n determining what network elements should be made available for purposes of subsection (c)(3) of this section, the Commission shall consider, at a minimum, whether – (A) access to such network elements as are proprietary in nature is necessary; and (B) the failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer.[35]

In other words, the FCC must determine a *standard* for defining how an entrant would be *impaired* from competing where services of the ILEC are bundled or unbundled to a greater or lesser degree.

To complicate matters, the 1996 Act also preserved a state role in addressing unbundling issues. First, Section 252 authorized states to review and to arbitrate interconnection agreements for compliance with the requirements of Sections 251 and 252 and the FCC's implementing rules.[36] Second, Section 251(d)(3) also preserved states' independent state law authority to address unbundling issues to the extent that the exercise of that authority posed no conflict with federal law.[37] That section provides that:

> [i]n prescribing and enforcing regulations to implement the requirements of this section, the Commission shall not preclude the enforcement of any regulation, order, or policy of a State commission that – (A) establishes access and interconnection obligations of local exchange carriers; (B) is consistent with the requirements of this section; and (C) does not substantially prevent implementation of the requirements of this section and the purposes of this part.[38]

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33. 47 U.S.C. § 153(35).
34. *See* 47 U.S.C. § 251.
35. 47 U.S.C. § 251(d)(2). Sec. 251(d)(2)(A) is a "necessary standard," but in practice, the necessary standard is rarely relevant.
36. 47 U.S.C. §§ 252(c)(1), (e)(1)-(2).
37. *See* 47 U.S.C. § 251(d)(3).
38. 47 U.S.C. § 251(d)(3). The states may exercise this state law authority in the course of reviewing interconnection agreements under section 252; *see also* 47 U.S.C. § 252(e)(3).

The 1996 Act gave the FCC authority only to establish a *minimum* list of unbundled elements,[39] an issue that continues to work its way around the courts,[40] and the states could freely expand the list as each state saw fit.[41] In fact, many states, including, for example, Illinois[42] and Texas,[43] mandated unbundling under state statutes. The operational rules used by the FCC in this directive created enormous problems and, in the end, all attempts to define impairment in a legally-defensible manner failed, with the courts remanding numerous attempts (see the review in Appendix A, *infra*).[44]

B. Pricing of Unbundled Elements

Critically, the prices for the unbundled network elements were to be regulated. In addition to the question of what was to be unbundled, the statute established standards to govern the pricing of UNEs in Sections 251 and 252.[45] For UNEs, Section 251(c)(3) provides that elements shall be made available "on rates, terms, and conditions that are just, reasonable, and nondiscriminatory."[46] Section 252 provides:

> [d]eterminations by a State Commission of the . . . just and reasonable rate for network elements for purposes of subsection [251](c)(3) . . . – (A) shall be – (i) based on the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing the . . . network element . . . , and (ii) nondiscriminatory, and (B) may include a reasonable profit.[47]

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39. *See, e.g.*, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, *Third Report and Order and Fourth Further Notice of Proposed Rulemaking*, 15 FCC Rcd 3696, 3796-97 (1999) [hereinafter *UNE Remand Order*].

40. *See, e.g.*, United States Telecom Ass'n v. FCC, 290 F.3d 415, 417 (D.C. Cir. 2002); Pac. Bell Tel. Co. v. California Pub. Utilis. Comm'n, 621 F.3d 836, 843 (9th Cir. 2010); *cert. denied*, 131 S.Ct. 3050 (2011).

41. 47 U.S.C. § 251(d)(3). Section 251(d)(3) of the 1996 Act provides the State commissions with the authority to establish unbundling obligations in above and beyond the FCC's national minimums, so long as those obligations are consistent with the purposes of the Act. This section of the Act was necessary because many States had already begun to promote competition by mandating unbundling by the time the 1996 Act was passed.

42. Illinois Public Utilities Act §§ 5/13-505.6, 514, 801.

43. Texas Utilities Code §§ 60.021-022.

44. *See, e.g.*, *UNE Remand Order*, *supra* note 40, at 3807-08; AT&T Corp. v. Iowa Utils. Bd., 525 U.S. 366, 389-90 (1999) (the following assumptions made by the Commission are not in accord with the ordinary and fair meaning of the terms "necessary" and "impair": (1) that any increase in cost or decrease in quality, imposed by denial of a network element, renders access to that element "necessary"; (2) failure to provide a "necessary" element will "impair" the entrant's ability to furnish the desired services).

45. 47 U.S.C. §§ 251, 252.

46. 47 U.S.C. § 251(c)(3).

47. 47 U.S.C. § 252(d)(1).

Section 252(d)(A)(i) of the 1996 Act required that wholesale prices for the unbundled network elements be "based on the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing the … network element."[48] Congress left the details of the particular cost standard to the FCC, and the agency established a forward-looking cost standard called Total Element Long-run Incremental Cost ("TELRIC"), a new cost standard without any precedent in U.S. regulatory proceedings.[49] The FCC concluded that a "cost-based pricing methodology based on forward-looking economic costs … best furthers the goals of the 1996 Act."[50] In dynamic competitive markets, firms take action based not on embedded costs, but on the relationship between market-determined prices and forward-looking economic costs."[51] The FCC further concluded, "[C]ontrary to assertions by some [incumbents], regulation does not and should not guarantee full recovery of their embedded costs."[52]

While the FCC defined the relevant cost standard, it was the *state* regulatory commissions that implemented the standard when setting wholesale prices for unbundled elements.[53] As recognized by the Supreme Court in *AT&T Corp. v. Iowa Utilities Board*,[54] the FCC could not establish a cost standard so strict that the standard effectively set the wholesale price.[55] Unquestionably, Section 252 of the 1996 Act gave the states the right to set wholesale prices.[56] States therefore had substantial latitude in setting wholesale prices, and were constrained only by the general forward-looking cost framework established by the FCC (*i.e.*, TELRIC).[57]

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48. 47 U.S.C. §252(d)(A)(i).

49. *See* Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, FCC 96-325, 11 FCC Rcd 15499, para. 29 (1996) [hereinafter *First Local Competition Order*]; *see also* Benjamin *et al.*, *supra* note 4, at 416-18. The use of Long-run Incremental Cost ("LRIC") had a long history in U.S. regulation, but appending the "Total Element" adjective to the concept rendered such history largely moot. In many respects, the failure of the FCC to stick to more traditional regulatory concepts and parlance opened the door for ILECs to attack to the unbundling regime. The legal fight over "TELRIC"—as a new concept—was intense, expensive, and a central strategy for ILEC resistance to the U.S. unbundling regime.

50. *First Local Competition Order*, 11 FCC Rcd at para. 620.

51. *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, CC Docket No. 96-98, 11 FCC Rcd 15499, para. 619. (1996).

52. *Id.* at para. 706.

53. 47 U.S.C. § 252(d)(1).

54. *See* 525 U.S. 366 (1999).

55. *See id.* at 423 ("The FCC's prescription, through rulemaking, of a requisite pricing methodology no more prevents the States from establishing rates than do the statutory "Pricing standards" set forth in §252(d). It is the States that will apply those standards and implement that methodology, determining the concrete result in particular circumstances. That is enough to constitute the establishment of rates.").

56. 47 U.S.C. § 252(d)(1).

57. In one case, the FCC was required to issue its own cost order for unbundled loops given the state regulator's failure to do so. Petition of WorldCom, Inc. Pursuant to Section 252(e)(5) of the Communications Act for Preemption of the Jurisdiction of the Virginia State

The statute also establishes a resale entry vehicle separate from the availability of UNEs. Section 251(c)(4) provides that ILECs have "[t]he duty . . . to offer for resale at wholesale rates any telecommunications service that the carrier provides at retail to subscribers who are not telecommunications carriers."[58] Because Section 251(c)(4) applies only to retail telecommunications services that the ILEC provides to subscribers, some ILEC services, such as wholesale-only services and information services, were not available at a resale discount to competing carriers.[59]

C. The Quid Pro Quo of Section 271

In return for opening their local markets to sharing, the 1996 Act permitted the ILECs (specifically, the firms referred to as the Bell Operating Companies or "BOCs") to enter the long distance market, a market that was already workably competitive.[60] The Bell Operating Companies were precluded from offering interstate long-distance services by the Modified Final Judgment of 1982, which broke up the AT&T monopoly.[61] This *quid pro quo* was detailed in Section 271(c)(2)(B) of the 1996 Act, which established a 14-point checklist that each ILEC must demonstrate that it has fully implemented prior to providing long distance services.[62] To satisfy the statute, the LEC was required to show that it was providing non-discriminatory access to each checklist item, meaning that the interconnection or element was provided or could be provided in quantities that competitors may reasonably demand and at an acceptable level of quality.[63] The fourteen items included: (a) interconnection; (b) access to unbundle network elements; (c) access to poles, ducts, conduits, and rights-of-way; (d) unbundled local loops; (e) unbundled local transport; (f) unbundled local switching; (g) 911 and E911, directory assistance, and operator services; (h) white pages directory listings; (i) numbering administration; (j) databases and associated signaling; (k) number portability; (l) local dialing parity; (m) reciprocal compensation; and (n) resale.[64]

Corporation Commission Regarding Interconnection Disputes with Verizon Virginia Inc., and for Expedited Arbitration, *Memorandum Opinion and Order*, 18 FCC Rcd 17722 (2003).

58. 47 U.S.C. § 251(c)(4).

59. *See* Appropriate Framework for Broadband Access to the Internet over Wireline Facilities, 20 FCC Rcd 14853, paras. 96-101 (2005).

60. *See* 47 U.S.C. § 271.

61. United States v. Western Electric Company, Inc., and American Telephone and Telegraph Company, *Modification of Final Judgment*, No. 82-0192 (D.D.C. 1982), http://web.archive.org/web/20060827191354/http://members.cox.net/hwilkerson/documents/AT&T_Consent_Decree.pdf; DAVID L. KASERMAN & JOHN W. MAYO, GOVERNMENT AND BUSINESS: THE ECONOMICS OF ANTITRUST AND REGULATION 595-609 (1995).

62. *See* 47 U.S.C. § 271(c)(2)(B)(i)-(xiv).

63. *See id.*

64. *See id.*

In practice, Section 271 of the Act would serve both as a complement and substitute for the requirements in Section 251 of the Act, providing some guidance on the specific elements that must be made available, and providing support for the availability of elements and other necessary services in instances where Section 251 was in legal limbo. However, the FCC would eventually reject the use of Section 271 as an alternative statutory requirement beyond the scope of Section 251 obligations.[65] Of course, once long distance authority had been granted, the incentive to comply with the unbundling mandates was materially diminished.[66]

D. Summary

In an effort to affirmatively nudge the local exchange telecommunications market toward a more competitive equilibrium industry structure, the 1996 Telecommunications Act required the incumbent local exchange monopolist to lease elements of their networks to its retail rivals.[67] In determining which network elements should be made available to competitors, §251(d)(2) instructed the Federal Communications Commission to consider, *at a minimum*, whether (A) access to such network elements as are proprietary in nature is necessary; and (B) the failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer.[68] State regulators also played a key role in establishing which portions of the network must be unbundled.[69]

Section 251's requirements became widely known as the "necessary" standard and the "impair" standards.[70] Because the "necessary" standard applies only to "proprietary" network elements, its application was limited.[71] Impairment, consequently, was the more noteworthy standard under which the availability of unbundled elements was to be determined.[72] The FCC would struggle implementing a workable definition of "impairment," and had its efforts repeatedly remanded by reviewing courts.[73]

These unbundled elements were to be sold at regulated prices, where such prices must be "just and reasonable" and "nondiscriminatory," based

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65. *See Triennial Review Order*, *supra* n. 17.

66. *See, e.g.*, Federico Mini, *The Role of Incentives for Opening Monopoly Markets: Comparing GTE and BOC Cooperation with Local Entrants*, 49 J. INDUS. ECON. 379-414 (2001).

67. 47 U.S.C. § 251(c)(3).

68. 47 U.S.C. § 251(d)(2)

69. *See* 47 U.S.C. § 251(d).

70. AT&T Corp. v. Iowa Utils. Bd., 525 U.S. 366, 374-75 (1999).

71. Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, *Third Report and Order and Fourth Further Notice of Proposed Rulemaking*, 15 FCC Rcd 3696 paras. 1-3, 7 (1999).

72. *Id.* at paras. 17-20.

73. *AT&T v. Iowa Utils. Bd.*, 525 U.S. at 389-91.

on "cost," and "may include a reasonable profit."[74] The Commission interpreted Section 251(c)(3) to imply that the price of a network element should be based on the forward-looking costs that can be attributed directly to the provision of services using that element, which includes a reasonable return on investment, plus a reasonable share of the forward-looking joint and common costs.[75] The agency's Total Element Long-Run Incremental Cost ("TELRIC") standard was intended not to reflect embedded or historical costs, opportunity costs or universal service subsidies.[76] Although hotly contested, the TELRIC pricing standard was deemed appropriate by the 2002 Supreme Court decision in *Verizon v. Federal Communications Commission*.[77] While the theoretical details of TELRIC were the subject of extensive debate and research, in practice the standard was sufficiently flexible in implementation at the state regulatory commissions to support a wide range of prices.[78]

III. ECONOMIC FUNDAMENTALS OF NETWORK COMPETITION

Put simply, the goal of the 1996 Act was to move from the *status quo* of one firm providing local telephone service (a monopoly) to multiple firms providing local telephone service (competition).[79] As the Supreme Court observed concerning the 1996 Act, Congress intended "to eliminate the monopolies" of the incumbent local exchange carriers ("ILECs") and to "reorganize markets … deliberate[ly]."[80] The goal of eliminating the historical local exchange monopoly was, according the Court, an "end in itself."[81] Put this way, it is immediately apparent that the economic theory of equilibrium industry structure—that is, the number of firms that can successfully serve a market—becomes relevant.

As shown by John Sutton in his seminal book SUNK COST AND MARKET STRUCTURE,[82] and discussed in reference to the

74. 47 U.S.C. § 252(d)(1).

75. *See First Local Competition Order*, *supra* note 50, at 3760-78.

76. *See id*. at paras.1730-31.

77. Verizon Communications, Inc. v. FCC, 535 U.S. 467, 475-89 (2002).

78. *See, e.g.*, T. Randolph Beard & George S. Ford, *Splitting the Baby: An Empirical Test of Rules of Thumb in Regulatory Price Setting*, 58 KYKLOS 331-51 (2005) ("I find that forward-looking economics costs (the relevant cost standard) contribute most to the determination of wholesale UNE prices for UNE-P when compared to embedded costs, retail prices, or the retail opportunity cost of the ILEC. Econometric evidence suggests that retail opportunity cost (Efficient Component Pricing Rule) also plays an important role in wholesale price setting. Overall, the evidence presented here suggests that State regulators have, to a large extent, set wholesale prices between forward-looking cost and the Efficient Component Pricing Rule rate. It appears, as is common in regulatory proceedings, that the interests of both parties have been balanced.").

79. *See AT&T v. Iowa Utilities Board*, 525 U.S. at 371.

80. *Verizon Communications*, 535 U.S. at 488-89.

81. *Id.* at 475-76.

82. *See* JOHN SUTTON, SUNK COST AND MARKET STRUCTURE 31 (1995).

telecommunications industries by Beard, Ford and Spiwak,[83] under some simplifying assumptions the number of firms than can profitably serve a market (i.e., the equilibrium number of firms, N^*) is the integer part of $N^* = \sqrt{(S/E)}$, where S is market size in terms of expenditures and E measures the (fixed) sunk entry costs.[84] As shown in this expression, the number of firms supplying a market is positively related to the size of the market (S), but inversely related to the sunk costs of entry (E). The larger are fixed/sunk costs, market size constant, the fewer the firms that can profitably supply the market and the higher is equilibrium industry concentration.[85] The larger is the market size, entry costs constant, the lower is the equilibrium industry concentration. At the time of the passing of the 1996 Act, and even now, fixed and sunk costs are prevalent in the local exchange market, to a greater or less extent in particular segments of the local market.[86] Expression (1) may be applied to particular sub-markets of the local exchange in cases where sub-markets may be served under regulatory constraints. For example, entry into the high-capacity business markets is a very different problem than entry into the residential local loop market, where the former was characterized by a relatively high size-to-entry-cost ratio, and consequently competition in business markets occurred first and to a greater degree.[87]

The implication of the economic theory is clear: the number of firms supplying a market is not unbounded when there are fixed and sunk costs. Given that much of the entry cost of telecommunications network is sunk and large relative to market size, industry concentration in telecommunications markets is expected to be relatively high. Indeed, until the 1996 Act, the legal presumption was that the local exchange market was a natural monopoly (i.e., $N^* = 1$).[88] While the technology and law governing the telecommunications industry had changed in the late 1980s and early 1990s, as was evident in the long distance segment of the industry, these changes had not meaningfully altered the supply-side economics of the local exchange.[89] Large numbers competition among facilities-based local

83. *See* T. Randolph Beard et al., *Why AdCo? Why Now? An Economic Exploration into the Future of Industry Structure for the "Last Mile" in Local Telecommunications Markets*, 54 FED. COMM. L.J. 421, 429 (2002); *see also* George S. Ford et al., *Competition After Unbundling: Entry, Industry Structure and Convergence*, 59 FED. COMM. L.J. 331 (2007).

84. The models assume all firms are identical. *See, e.g.*, 54 FED. COMM. L. J. 421, 429, n. 23.

85. In the *Triennial Review Order*, for example, the Commission observed: "Larger fixed and sunk costs imply that fewer firms are able to survive profitably in the industry." *Triennial Review Order*, *supra* note 17 at para. 80.

86. *See* Jerry Hausman, *The Effect of Sunk Costs in Telecommunications Regulation*, Columbia University Symposium (Oct. 2, 1998), http://economics.mit.edu/files/1027.

87. *See* BENJAMIN ET AL., *supra* note 4, at 385-86.

88. U.S. Department of Commerce, *Telecommunications in the Age of Information: the NTIA infrastructure Repo*rt, NTIA Special Publication 91-26, 271 (1991)

89. *See* BENJAMIN ET AL, *supra* note 4, at 340-41, 350-56, 385.

exchange carriers in the *mass market* was forbidden by the supply-side economics of the industry.[90]

Recognizing, to some extent, the economic forces working against multi-firm supply in the local market, the 1996 Act aimed to alter the competitive landscape of local telecommunications by addressing the large fixed and sunk costs of constructing last mile (and related) local communications network (e.g., switching), and proposed to do so by splitting the integrated local phone market into wholesale and retail components.[91] In the post-1996 Act environment, firms seeking to offer retail local telephone services needed not construct a local exchange network, but could offer services by acquiring the necessary facilities in a "wholesale market" where such facilities would be bought and sold.[92] In effect, ILECs were required to unbundle various components of their local networks so as to "share" with their competitors the inherent economies of scale built into their ubiquitous local networks.[93] Policies to reduce or otherwise ameliorate the effects of such barriers to entry were expected to strengthen competitive rivalry and improve market performance.[94]

This division of the ILEC into wholesale and retail segments did not, however, fundamentally alter the supply-side economic conditions of facilities-based entry. The Act's unbundling requirements targeted directly the retail segment, with the aim of lowering entry costs in the hopes of increasing the number of retail providers, and in that regard the Act was successful.[95] By 2004, there were nearly two hundred CLECs providing services using unbundled elements.[96] But the unbundling requirements reduced entry costs almost exclusively for retail segment, doing little to reduce the costs of replicating local loop plant.[97] Building local communications plant remained costly and, for the most part, cost

90. *See* Beard, *supra* note 84.

91. *See Verizon Communications Inc. v. FCC*, 535 U.S. 467, 490-91 (2002). ("Congress passed a ratesetting statute with the aim . . . to reorganize markets by rendering regulated utilities monopolies vulnerable to interlopers." "The Act . . . favor[ed] novel ratesetting designed to give aspiring competitors every possible incentive to enter local retail telephone markets . . ." "Since wholesale markets for companies engaged in resale, leasing, or interconnection of facilities cannot be created without addressing rates, Congress provided for rates to be set either by contracts between carriers or by state utility commission rate orders"). For a full discussion of the *Verizon* Opinion, *see* Spiwak, *The Telecoms Twilight Zone: supra* n. 6; L. J. Spiwak, COMMUNICATIONS WEEK INTERNATIONAL**,** *Opinion: U.S. Competition Policy – The Four Horsemen of the Broadband Apocalypse* (Apr. 1, 2002), http://www.phoenix-center.org/commentaries/CWIHorsemen.pdf.

92. *See Verizon Communications*, 535 U.S. at 467.

93. *See id.*

94. 47 U.S.C. § 1302 (2012).

95. *See* 47 U.S.C § 253.

96. *Local Competition Report*, *supra* note 7, at tbl. 4.

97. One potential role of unbundling for improving entry conditions into the local exchange was the creation of non-incumbent demand for network. For a full discussion, *see* Beard, *supra* note 84.

prohibitive. Very few of the residential and small business customers of CLECs were served over competitor local loop plant.[98]

As detailed in Beard, Ford and Spiwak, the financial data from facilities-based entrants demonstrated the difficulty with entry into the local market at the time.[99] For instance, the entrant RCN mostly targeted residential customers in densely populated markets with its own facilities-based network over which it provided telephone, data and video services.[100] According to its financial documents from the late 1990s, the company had $2.75 billion in a network that passed about 1.5 million homes, or 1.1 million marketable homes.[101] As such, network costs ran about $1,750 per home passed, $2,500 per marketable home, or about $6,500 per customer.[102] On average, RCN's monthly plant costs (assuming a 15% hurdle rate and 15 year payoff) was about $25 per home passed. Average revenue per subscriber per month was about $130 and direct costs were about 46% of revenues, producing a gross monthly margin of about $68 per subscriber. For revenues to cover plant costs, RCN needed a penetration rate of about 35-40%. *The implications are plain: if a 40% penetration is required for profitability, then only two firms can profitably service the same market, and RCN and the incumbent makes two.*[103] Since RCN's entry strategy targeted markets where the entry conditions were relatively favorable, these numbers likely reflect a best-case scenario. Beard, et al., estimate that to construct an RCN-style network for every household in the U.S., the plant investment and total entry costs would have been at the time about $300 billion and $600 billion, respectively.[104] Clearly, facilities-based

98. As a consequence of the data collection rules, in many cases what was described as a CLEC-owned loop was actually an unbundled loop, particularly in the business markets.

99. *See* Beard, *supra* note 84

100. *See* RCN CORPORATION CORPORATE PROFILE (1998), https://transition.fcc.gov/enbanc/012998/rcn.pdf.

101. Marketable homes are those homes that RCN's network can immediately serve.

102. Values based on RCN's 1998, 1999, and 2000 Annual Reports. For example, between 2000 and 1999, RCN's Plant and Property grew by $1.5 billion while its marketable homes grew by about 550,000. In 1999, RCN's penetration rate into marketable homes was about 40%.

103. With a reasonable guess of the minimum penetration a firm needs to cover its costs, the number of firms that can operate in a market is (the integer part of) the inverse of the minimum penetration (*e.g.*, 1/0.40 = 2.5).

104. These investment estimates are rough and replicated from *Why ADCo, Why Now? See* Beard, *supra* note 84. Plant investment is estimated by assuming the cost differentials and population distributions across density zones are similar to those estimated by the HAI Model (v. 2.2.2). RCN's current network is assumed to be deployed in the two most-dense zones. Non-plant entry costs are assumed to be about $1 for every $1 of plant (*see* Table 1). Seven years after this estimate was first published, the *National Broadband Plan*'s team produced an estimate for a nationwide high-speed network that was very close to this number. http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-293742A1.pdf).

entry is incredibly costly, requiring a large penetration rate for financial success.[105]

Another important misconception policymakers and Wall Street had about the local market was that the cost of entry was limited to just the cost of network construction and architecture. Quite to the contrary, entry into the telecoms business required the additional commitment of significant costs for billing systems, regulatory efforts and responses, pre-positive cash flow general administrative costs and, perhaps most significant of all, customer acquisition and retention costs.[106] Galbi estimated that the annual marketing expenses for the long-distance segment were sizeable (relative to revenues) and subject to economies of scale.[107] Other sources indicated that acquisition costs for residential local or long-distance customers were about $150 per customer, virtually all of which was sunk.[108]

The magnitude of non-plant entry costs was also sizeable. Table 1, replicated from Beard, et al., illustrates the proportion of facilities investment (measured as net plant, in millions of dollars) to total entry costs for a sample of CLECs.[109] Entry costs are measured as the spent portion of capital invested in the firm including debt and equity. As illustrated by the table, investment in plant was typically a very small proportion of total dollars invested by CLECs. As further demonstrated by Table 1, the ratios of expense costs to plant costs range significantly from ITC's relatively low ratio of 1.5:1 all the way to Covad's ratio of 8:1. On average, however, net plant amounted to about 37% (approximately two-thirds) of total entry costs (for this sample). In other words, for every dollar of investment in plant and equipment, an additional $2 of entry costs were incurred, on average, by the CLECs.

105. RCN would eventually enter bankruptcy, but still provides service in a few urban markets today. Dana Cimilluca & Brett Cole, *RCN Considers Sale After Emerging from Bankruptcy*, BLOOMBERG (Sept. 13, 2006), http://www.bloomberg.com/apps/news?pid=newsarchive&sid=akzWsX8zY5dI.

106. FCC, STATISTICS OF COMMC'N COMMON CARRIERS (1997), https://transition.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/SOCC/96socc.pdf.

107. Douglas A. Galbi, *Some Costs of Competition* (Jan. 24, 1999) (unpublished manuscript), http://www.galbithink.org/cc4m.pdf.

108. *See* FOR WHOM, THE BELLS' TOLL? 55-56 (Bernstein Glob. Wealth Mgmt.) (1997); *see also Juno Posts Deep Loss on Ad Costs but Beats Wall Street Expectations*, WALL ST. J. (Oct. 27, 1999, 4:48 PM), http://www.wsj.com/articles/SB941028430412126496.

109. Thomas Beard et al., *Why ADCo? Why Now? An Economic Exploration into the Future of Industry Structure for the 'Last Mile' in Local Telecommunications Markets*, 54 FED. COMM'NS L.J. 421, 433 (2002), http://www.phoenix-center.org/papers/ADCOFCLJ.pdf.

Table 1. Entry Costs and Plant

($ millions)

CLEC	Entry Costs (E)	Net Plant (P)	E/P	P/E
XO	$10,739	$3,505	$3.06	34%
Allegiance	$2,083	$939	$2.22	45%
RCN	$4,859	$2,331	$2.08	48%
Covad	$2,414	$294	$8.20	12%
McLeod	$8,260	$3,220	$2.57	39%
Talk.com	$429	$80	$5.37	19%
Northpoint	$1,041	$455	$2.29	44%
ITC^ Deltacom	$1,036	$708	$1.46	68%
US LEC	$369	$191	$1.93	52%
Wgt. Average*	…	…	$3.06	38%

Plainly, even after the implementation of the unbundling requirements, the economies of scale and sunk costs remained a significant hurdle for competitors, and greatly limited facilities-based entry. Moreover, many of these operational costs related to acquisition, billing, regulation, and working capital applied to entrants using unbundled elements. Profitable CLECs, even those with heavy reliance on unbundled elements, were difficult to find.

The difficulty with replicating even those elements of the network often deemed replicable, such as switching, were demonstrated to be prohibitively costly in the end. This fact was clearly revealed after the FCC's *Triennial Review Remand Order* where unbundled switching was to be quickly phased out.[110] According to the FCC, the CLECs using unbundled switching and loops (a package referred to as the "UNE-Platform" or "UNE-P") would simply migrate to using unbundled loops with their own switching equipment (a package referred to as "UNE-Loop" or "UNE-L") if unbundled

110. Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, *Order on Remand*, 20 FCC Rcd 2533, para. 222 (2005) [hereinafter *Triennial Review Remand Order*] ("we conclude that neither economic nor operational impediments associated with switch deployment or hot cuts pose barriers to entry sufficient to give rise to impairment on a nationwide basis").

switching was not available.[111] A review of the evidence does not support the FCC's position.[112] In Figure 1, the FCC's count of the number of UNE-P and UNE-L lines over the 1999 to 2010 time period are illustrated.[113] Peaking in 2004, UNE-P lines fell precipitously following the *Triennial Review Remand Order*. Under the substitution theory, UNE-L should have risen to offset such declines. Yet, as the figure shows, UNE-L did not increase, but instead has also been in a steady decline. For the most part, the technology of the period did not practically permit the combination of unbundled loops (at least those serving residential and small business users) with CLEC-supplied switching.[114] The rise of new technologies capable of providing high-quality voice services also took a toll on CLEC business plans.[115]

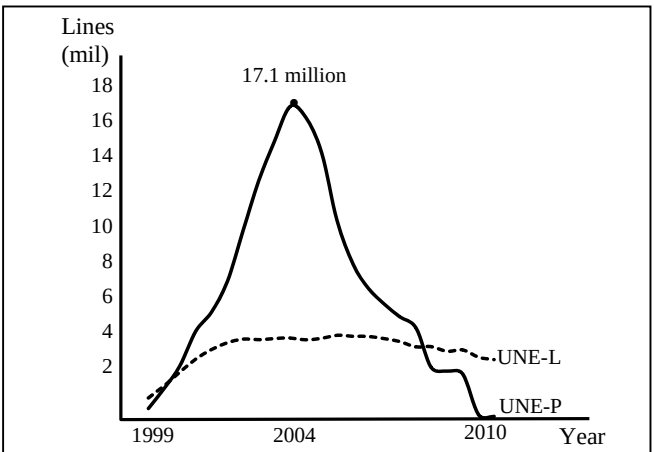

Figure 1. CLEC Lines Served by UNE-P and UNE-L

By many accounts, the failure of the UNE-L model, on any broad scale, was inevitable. In order to facilitate UNE-L, the ILEC network had to be manually dismantled and reconnected to CLEC switches (via collocation

111. In the *Triennial Review Remand Order*, the Commission directed CLECs to migrate their retail customers served using unbundled switching to alternative arrangements by March 11, 2006 (within 12 months of the date the order went into effect). *Id*. at 148.

112. The substitution theory was demonstrated false in T. Randolph Beard & George S. Ford, *Are Unbundled and Self-supplied Telecommunications Switching Substitutes? An Empirical Study*, 12 INT'L J. ECON. BUS. 163-81 (2005).

113. FCC WIRELINE COMPETITION BUREAU, LOCAL TELEPHONE COMPETITION: STATUS AS OF JUNE 30, 2011 tbl. 5, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-314631A1.pdf); *Local Competition Report*, at Table 4.

114. Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, *Order on Remand*, FCC 04-290, para. 193 (2004).

115. FCC WIRELINE COMPETITION BUREAU, LOCAL TELEPHONE COMPETITION: STATUS AS OF JUNE 30, 2011 tbl. 12. (2011).

equipment).[116] The ILEC loops were (for practical purposes) hardwired to the ILEC switch so that customer migrations were very labor intensive.[117] The manual process of physically moving loops from an ILEC frame to a CLEC collocation—a "hot cut"—was a costly and error prone process.[118] Certainly, such manual movement of wires was not scalable to a level commensurate with widespread competition.[119] In retrospect, repeatedly undoing physical connections that had been wired over decades in an effort to minimize human intervention was nonsensical, as a trip to any ILEC wire center would have plainly demonstrated.[120] Thus, the provision of local telephone service using unbundled loops required that, as a practical matter, the unbundled switching element be included, avoiding the costly human effort required for hot-cuts.[121] This reality was problematic for U.S. policy, since the theory of unbundling viewed the migration to self-supplied switching from unbundled switching as a presumably early and relatively easy step in the move toward facilities-based entry in the local exchange.[122] This migration never materialized.

IV. REGULATED ACCESS TO THE NETWORK AND SABOTAGE

In *Verizon*, the Supreme Court observed that "wholesale markets for companies engaged in resale, leasing, or interconnection of facilities cannot be created without addressing rates."[123] Intuitively, if access must be mandated, then the rate paid for such access might also need to be mandated, so not only did the 1996 mandate the ILECs to unbundle their networks for competitors, but also established that the rates paid for such elements were

116. *See generally Comparing ILEC and CLEC Local Network Architectures*, AT&T Presentation to FCC (Oct. 3, 2002) (discussing the structural network differences between ILECs and CLECS), http://apps.fcc.gov/ecfs/document/view;jsessionid=h8fRTJNFp7JPyGgPgyZ2vsxgdzbPg1yXTRllpLHHHLlG0MHFH65g!1281169505!1675925370?id=6513294531).

117. *Id*.

118. *Id*. at 19.

119. *Triennial Review Order*, *supra* note 8, at para. 469 ("we find that the number of hot cuts performed by BOCs in connection with the section 271 process is not comparable to the number that incumbent LECs would need to perform if unbundled switching were not available for all customer locations served with voice-grade loops").

120. *See, e.g.*, *Triennial Review Order*, *supra* note 8, at para. 468 (finding that carriers are unable to keep up with the number of hot-cuts needed).

121. *Cf. Triennial Review Order*, *supra* note 8, at para. 475 ("[W]e find that current conditions at the national level demonstrate that competitive LECs are impaired without unbundled switching for mass market customers based on the costs and delays associated with hot cuts.").

122. *See Triennial Review Order*, *supra* note 8, at para. 475.

123. *Verizon Commc'ns, Inc.*, 535 U.S. at 492.

to be regulated. [124]This regulation of access rate, while perhaps sensible in some respects, also created a problem with incentives.[125]

As a practical matter, an unbundled loop (with or without switching) is almost always used to serve a customer of the ILEC from which the loop is leased. The ILECs were essentially monopoly providers of local phone service and were the only companies required to unbundle their networks.[126] An unbundled loop, therefore, meant losing a customer and the profit margin on that customer, and this lost margin is part of the opportunity cost of selling the element. The incentives are plain to see: if the regulated price for the unbundled elements does not cover both costs and the lost margin, then the sell of the element reduces profits and the ILEC does not benefit from the transaction. The spread between the regulated price and the opportunity costs gives the ILEC an incentive to sabotage the transaction (or, sabotage the entire regulatory scheme). To the economist, the term "sabotage" has a very specific meaning—it is the ability of a dominant firm to raise the cost of a rival's key input of production through non-price behavior.[127] Regulated unbundled element prices created an inherent tension in the wholesale supplier/retail competitor conflict, and it was the regulated price that produced a strong incentive for resistance and manipulation. While laypersons often attribute sabotage to the presence of market power, economic models show clearly that sabotage is always a consequence of regulating prices in a forced transaction.[128]

The problem was discussed in a paper by Beard, Ford and Spiwak (2005).[129] Their economic model modeled a scenario similar to the unbundling regime by assuming, among other things, the following: (a) there is a large, integrated (wholesale and retail) incumbent (*e.g.*, the ILEC) that is supposed to sell unbundled elements to retail competitors at regulated prices; (b) there exists scale economies in network (wholesale) operations,

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124. *See* 47 U.S.C. § 251(c)(2)-(3), (d)(1).

125. *See, e.g.*, *Triennial Review Order*, *supra* note 8, at para. 330.

126. *Cf.* Beard, *supra* note 49, at 435 ("Nearly all [competitor] entrants, for example, must deal with the ILEC in some way.").

127. *See* T. Randolph Beard et al., *Regulation, Vertical Integration, and "Sabotage"*, 49 J. INDUS. ECON. 319, 320 n.3 (2001) ("[S]abotage is an indirect method of raising rivals' costs . . . it involves non-price conditions of supply.").

128. T. Randolph Beard, David L. Kaserman & John W. Mayo, *Regulation, Vertical Integration, and "Sabotage"*, 49 J. INDUS. ECON. 319, 328 (2001) ("Without regulation . . . sabotage has no value."). The concept of "sabotage" is explored in great technical length in T. Randolph Beard, David L. Kaserman & John W. Mayo, *Regulation, Vertical Integration, and "Sabotage"*, 49 J. INDUS. ECON. 319 (2001). *See also* David Mandy & David Sappington, *Incentives for Sabotage in Vertically Related Industries*, 31 J. REG. ECON. 235 (2007). A paper by Economides (1998) concludes that sabotage may occur in the absence of price regulation, but the author's analysis of the Economides proof revealed a mathematical error. Nicholas Economides, *The Incentive for Non-Price Discrimination by an Input Monopolist*, 16 INT'L J. INDUS. ORG. 271, 275 (1998). For other problems with the paper, also see Mats Bergman, *A Note on N. Economides: The Incentive for Non-Price Discrimination by an Input Monopolist*, 18 Int'l J. Indus. Org. 985 (2000).

129. *See* Beard, *supra* note 84, at 443.

and these may be substantial; (c) wholesale services/elements are required to provide retail services, on a "one for one" basis; and (d) margins and prices are such that retail competition is viable if retail competitors are able to obtain elements at the long run average costs of an efficient competitor, which ensures that competition is viable and thus a reasonable expectation and policy goal. For present purposes, the relevant notation includes the following: *MS* is the retail market share of dominant firm; *S* is the wholesale market share of the dominant firm; γ is the typical retail margin (revenues less retail costs and element costs); $C(S)$ is the cost of network of "size" S_j, with $C' > 0$ and $C'' \leq 0$[130]; and $\check{r}$ is the regulated price of "network elements.

Now, consider an integrated firm (and ILEC) with network "market share" *S* and retail market share *MS*. The marginal opportunity cost of transferring control of one element to a competitor, *t*, is then

$$t = C'(S) + MS \cdot \gamma \qquad (1)$$

where the first term, $C'(S)$, represents the ordinary marginal cost of an element given a network of "size" *S*.[131] The second term, $MS \cdot \gamma$, is the potential impact of the sale of the unbundled element on the seller's profits. The sale of an unbundled loop causes the seller to lose a retail customer with probability *MS*. If the seller has a market share of 90%, then the sale of a loop has a 90% chance of resulting in a lost customer for the seller of the loop. The parameter γ is the retail margin, so $MS \cdot \gamma$ is the expected lost retail margin from the sale of an element. Thus, the total cost of the element transfer is $C'(S) + MS \cdot \gamma$ (the marginal cost plus the lost retail margin of the element).[132]

This simple model reveals two key points. First, the larger the market share of the seller, the lower are the seller's marginal cost; if $S_1 > S_2$, then $C'(S_1) < C'(S_2)$. That is, there are scale economies. Second, the larger is the seller's retail market share and the larger is the profit margin, the higher are the seller's opportunity cost (*t*).

Figure 2 illustrates the opportunity cost to the dominant firm from selling a element (or a collection of them used to serve a single account), and compares it to the regulated price for the element ($\check{r}$).[133]

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130. *See id*. at 444 n.66. The notation $C'(S)$ indicates marginal cost, where marginal cost is the first derivative of the cost function with respect to the quantity of element produced. The second derivative of the cost function is $C''(S)$. These assumptions merely imply that producing elements is costly ($C'(S) > 0$), but that there are scale economies in this process ($C''(S) \leq 0$). There are no fixed costs, so scale economies are modeled as a declining marginal cost.

131. *See id*. at 445 n.67. The Efficient Component Pricing Rule ("ECPR") calls for a price equal to *t*. TELRIC pricing is roughly equivalent to average cost pricing, or price is equal to $C(S)/S$.

132. *See id*. For simplicity, the retail margin γ was assumed to be unaffected by the sale of one element.

133. *See id.* at 447.

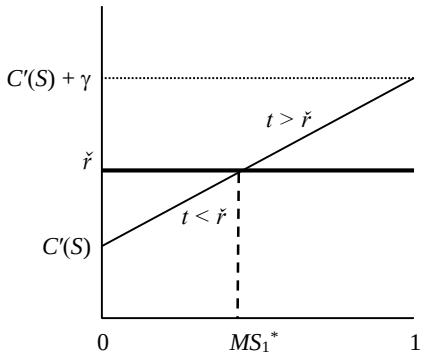

Figure 2. Revenue, Opportunity Cost and Market Share

In this figure, ř is assumed to be sufficiently high that it exceeds the long-run incremental cost of the dominant firm, but this does not imply that $\check{r}$ is remunerative. Figure 2 shows that the dominant incumbent is willing to sell the element at $\check{r}$ only if $MS_1 < MS_1^*$. If market share exceeds MS_1^*, then the opportunity cost (t) exceeds $\check{r}$ and the dominant firm has no desire to sell elements. In the late 1990s and early 2000s, during the period of most unbundling activity, the market shares of the ILECs were close to 100%. In the basic model, it was assumed that the retail competition from unbundled elements did not affect the retail margin. If γ falls as more element sales are made, the incentive not to sell unbundled elements is strengthened.[134]

Given the implementation of the unbundling provisions of the 1996 Act, the ILECs were legally required to sell elements and do so at price $\check{r}$.[135] As just shown, the ILEC does not want to sell such elements if the regulated price is below its opportunity cost. It was required to make such sells, however, and thus might resort to sabotage to reduce them. To see this, let z be a non-price cost imposed per element on buyers (*i.e.*, z is a cost to buyers, $z \geq 0$, but not a revenue to the seller). If imposing the cost z is a possible, what level of elements sales would the dominant firm choose? When $MS_1 < MS_1^*$, the incumbent does not want to sell elements at all. Thus, in such cases, z will be set at its maximum feasible value to impede sales. Thus, if the dominant firm is able to impose z on its rivals (that is, "sabotage" the transactions), its incentives are to do so.[136] In an effort to counter these

134. *See id.* Lower retail margins reduce opportunity costs and thus encourage element sales. However, the seller will not purposefully reduce its retail margin through the sale of elements to reduce its opportunity costs.

135. *See id.* at 448.

136. *Cf.* Yuki Noguchi, *CLECs Blame Bells, Bells Blame Hookups, Some Blame Agencies*, WASH. POST, Dec. 16, 2000, at E1 (noting allegations of ILEC sabotage); Peter S. Goodman, *FCC Chief Stresses Phone Competition*, WASH. POST, May 8, 2001, at E1 (same). Some examples of FCC Enforcement include: (a) On September 14, 2001, the FCC's Enforcement

incentives, the FCC and state regulators created "performance assessment plans" that monitored for discriminatory performance using statistical testing and imposed penalties when discrimination was found. The enforcement regimes were ineffective, in large part because the statistical sophistication of such programs were beyond the capabilities of the regulators, the transactions were very complex and often interconnected with other transactions, and the penalties were too low.

Accordingly, it was price regulation of unbundled network elements below *opportunity* cost (though perhaps above some technical measure of cost) that produced the incentive to sabotage unbundling. This sabotage was directed both at the CLECs, or the transactions involving the CLECs, and the entire unbundling regime via litigation and federal and state regulatory activity. Over time, the political, regulatory and legal support for the unbundling mandates would eventually collapse under the relentless assault brought to bear by the ILECs, and, as discussed later, the diminishing size of the local exchange market. While the Supreme Court was generally supportive of the unbundling mandates, many lower courts were not,[137] culminating in the District of Columbia Circuit's vacation of the *Triennial Review Remand Order* in *United States Telecom Ass'n v. FCC* ("*USTA*

Bureau announced a Consent Decree with Verizon Communications, Inc. (Verizon), under which Verizon will make a "voluntary payment" of $77,000 to the United States Treasury and will take certain remedial actions regarding its collocation practices, Verizon Comm., Inc., *Order*, 16 FCC Rcd. 16270 (2001); (b) on May 29, 2001, the FCC affirmed its Enforcement Bureau's $88,000 fine imposed in March 2001 against SBC Communications, Inc. for violating reporting requirements that the FCC imposed pursuant to its approval of the merger application of SBC and Ameritech Corp, SBC Comm., Inc., *Order on Review*, 16 FCC Rcd. 12306 (2001); (c) similarly, on January 18, 2001, the FCC sought to fine SBC Communications, Inc. (SBC) $94,500 after an independent audit discovered that SBC failed to comply with the FCC's rules that require incumbent telephone companies to allow competing telephone companies to place equipment in the incumbents' offices—in particular, that SBC failed to promptly post notices of all incumbent owned sites that had run out of collocation space such that competitors do not waste time and resources applying for collocation space where none exists, SBC Comm. Inc., *Notice of Apparent Liability for Forfeiture*, 16 FCC Rcd. 1012 (2001); (d) On November 2, 2000, the Federal Communications Commission settled with BellSouth Corporation to have them make a "voluntary payment" of $750,000 to the United States Treasury and to take important steps to improve its compliance with FCC rules relating to the negotiation of interconnection agreements between competing carriers. BellSouth Corp., *Order*, 15 FCC Rcd. 21756 (2000). Indeed, the FCC's investigation disclosed that, for more than six months in 1999, BellSouth failed to provide a competitor with cost data to support BellSouth's proposed prices for unbundled copper loops, despite the competitor's written request for such data. *Id.* para. 5. And, in addition to the $750,000 voluntary payment, the Consent Decree obligates BellSouth to adopt procedures for expedited access to confidential information (including issuance of a standard non-disclosure agreement that complies with the relevant FCC rules) and to adopt procedures for competitors to elevate disputes regarding disclosure of confidential information to higher levels within BellSouth. *Id.* para. 13. In addition, BellSouth will provide training to its negotiators concerning the relevant statutory and regulatory requirements, as well as BellSouth's revised procedures. *Id.* para. 14.

137. *See infra* Appendix A (collecting and summarizing cases).

II").[138] When the Bush Administration made the affirmative decision not to seek *certiorari* of *USTA II*,[139] the unbundling experiment of the 1996 Act was effectively over (see unbundling line counts in Figures 1 above and 3 below).

V. THE RISE OF ALTERNATIVE DISTRIBUTION PLATFORMS

In the early 1990s, the local telephone market was reasonably characterized as a static monopoly experiencing relatively slow technological innovation. The network was also ubiquitous, but this wide geographic coverage was possible only through multi-billion dollar subsidies, much of which was funded internally by the ILECs.[140] This was the environment in which the 1996 Act was passed. A surprising fact to many is that the Telecommunications Act of 1996 only had passing references to high-speed Internet service and mobile communications.[141] At the time, these technologies were not viewed as significant potential providers of local telecommunications services. Yet, today, these two technologies are used to provide over half of the local telephone connections to U.S. households.[142]

With a relatively static network provided by a monopolist it would *seem* relatively easy to identify elements of the network suitable for unbundling and likely relatively easy to estimate the cost of such elements. Neither proved easy in the end.[143] Alternately, in a dynamic setting where new investments in network were required (which are more sensitive to pricing than is embedded plant), whatever difficulties were present in implementing an unbundling regime in 1996 expanded exponentially less than a decade later.[144]

Unbundling was intended to promote competition with the expected benefit of that competition being lower prices, higher quality, and so forth. Such gains might be expected to be large when the policies are directed at the de-monopolization of the local market. As competition developed from

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138. *See* United States Telecom Ass'n v. FCC, 359 F.3d 554 (D.C. Cir. 2004).

139. *See* FCC, *Office of Solicitor General Will Not Appeal DC Circuit Decision* (June 9, 2004), https://apps.fcc.gov/edocs_public/attachmatch/DOC-248220A1.pdf; *see also* Press Release, Dep't of Comm. & NTIA, *Statement by Acting NTIA Administrator Michael D. Gallagher on Solicitor General's Decision not to Appeal DC Circuit Court Decision* (June 9, 2004), http://www.ntia.doc.gov/legacy/ntiahome/press/2004/ mdgstatement_06092004.htm; *Bush Administration Won't Back Appeal of TRO Ruling; FCC Majority Splinters*, TR Daily (June 9, 2004).

140. FCC, TRENDS IN TELEPHONE SERVICE, tbl. 19.5 (2010), https://apps.fcc.gov/edocs_public/attachmatch/DOC-301823A1.pdf.

141. *Compare* Telecommunications Act of 1996, 110 Stat. 56, § 706 (1996) with FCC, TRENDS IN TELEPHONE SERVICE (2010) at Section 2.

142. *See* FCC, TRENDS IN TELEPHONE SERVICE, tbl. 2.3 (2010).

143. *See generally* FCC, LOCAL COMPETITION REPORT 26, fig. 5 (2010), https://apps.fcc.gov/edocs_public/attachmatch/DOC-301310A1.pdf.

144. *Id.* (As broadband Internet service diffused through the U.S. economy, cable television systems were rolling out broadband and telephone services over their existing plant.)

other sources, however, the benefits of unbundling-facilitated competition became smaller. With the value of unbundling shrinking, the economic case for regulatory-mandated unbundling was reduced. At last count, the once-monopoly ILECs were serving fewer than half of switched access lines (the type of service targeted by unbundling policies for residential and small business customers). Moreover, as part of this competition came from mobile wireless technologies, the market for landline access services, which was the target of unbundling policies, was also in decay. This movement by consumers to wireless services and over-the-top VoIP services (e.g., Skype and cable television operators) weakened the prospect for "stepping stone" facilities-based entry by shrinking the market, as well as attenuating the total expected benefits of any price reductions resulting from element-based entrants.[145]

In Figure 3, we illustrate the path of access line activity and long distance toll revenues in the U.S. over the past decade on the left-hand side figure.[146] In 1999, there were about 181 million landline, end-user switched access lines.[147] Today, there are only 95 million access lines (including some VoIP lines). Long distance revenues have fallen from $108 million to only about $60 million (in 2008).[148] These declines are facilitated by wireless substitution, a reduction in second lines (in part due to broadband Internet), and perhaps some data collection anomalies. In any case, by FCC counts, the size of the switched access market has been cut essentially in half.[149]

145. Wireline service prices were regulated during the period of unbundling, softening the price effects of competition (assuming the regulated price was less than the monopoly price).

146. *Local Competition Report*, *supra* note 16 (Landline Switched Access Lines, VoIP Lines, and UNE Lines at Table 3); TRENDS IN TELEPHONE SERVICE, *supra* note 162 (Long Distance Revenues, at Table 9.2); Stephen J. Blumberg & Julian V. Luke, *Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, July-December 2010*, CENTER FOR DISEASE CONTROL (2011), at Table 1; U.S. households from U.S. Census Bureau,
http://www.census.gov/population/projections/nation/hh-fam/table1n.txt.

147. *See id.*

148. *See* TRENDS IN TELEPHONE SERVICE, *supra* note 162, at tbl. 9.2 (Long Distance Revenue).

149. *See id.*

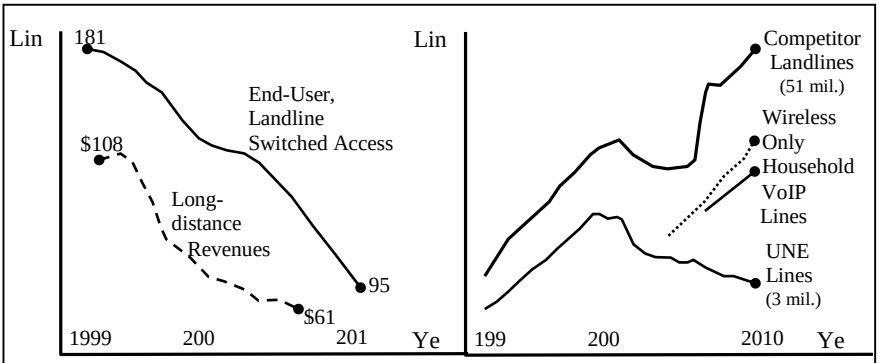

Figure 3. Landline Access Lines over the 1999 to 2010 Time Period

In the right-hand side figure of Figure 3, we track the type of access technologies used by competitors to the former ILEC monopolists. While unbundling lines have fallen off precipitously since 2004, wireless-only households and VoIP connections have risen quickly.[150] The post-2004 dip in competitor access lines is partly a result of UNE line losses, but also a consequence of data collection anomalies. VoIP data, for example, was not collected by the FCC until 2008.[151] Since VoIP-lines and wireless-only households shrink the relevant market for competitors using unbundled elements, the prospects for a successful unbundling regime were significantly weakened by the evolution of new access technologies. The competitive implications of unbundling was also much diminished, since price cuts by unbundled element entrants and the quantities to which such cuts apply were rapidly shrinking.

A dwindling local exchange market, both from wireless substitution and VoIP, also created problems for the subsidy schemes used by regulators to support ubiquitous coverage of wireline networks. The 1996 Act, by Section 254, required the FCC to make explicit the plethora of implicit subsidies schemes used to support ubiquity.[152] Exposing such subsidies, however, was not in the interest of politicians and regulators. Even today, the FCC continues to migrate to a more explicit subsidy regime.[153] Unbundling competition and intra-modal competition was largely targeted

150. *See infra* Figure 3.

151. *See* Steven Rosenberg, *Tracking VOIP: What We Know*, FCC (June 25, 2010), https://www.fcc.gov/news-events/blog/2010/06/25/tracking-voip-what-we-now-know?page=1.

152. *See, e.g.*, 47 U.S.C. § 254(b)(5) (2012) ("There should be specific, predictable and sufficient … mechanisms"); 47 U.S.C. § 254(e) (2012) ("Any such support should be explicit…")

153. *See, e.g., In re* Connect America Fund, *Report and Order and Further Notice of Proposed Rulemaking*, FCC 11-161, 26 FCC Rcd 17663 (2011); George S. Ford, *On the Road to More Efficient Pricing of Telecommunications Services: A Look at the Evidence*, Phoenix Center Perspectives No. 11-06 (Oct. 5, 2011), http://www.phoenix-center.org/perspectives/Perspective11-06Final.pdf.

to markets that sourced the subsidy, and thereby threatened the entire Universal Service subsidy regime. Continuation of unbundling was costly under such threats, both politically and in actual subsidy generation. As economist Professor Robert Willig observed, "cross-subsidies are the enemy of competition, because competition is the enemy of cross-subsidies."[154] With the potential benefits of unbundling falling, and its costs rising, the end of the regulatory-supported sharing of networks was inevitable.

VI. CONCLUSION AND POLICY RECOMMENDATIONS

With the Telecommunications Act of 1996, the United States sought to establish competition and deregulation as the foundation for public policy towards the telecommunication industry. [155] Although the Federal Communications Commission had opened monopoly telecommunications markets to entry for more than twenty years prior to the adoption of the 1996 Act, the Communications Act of 1934, which the 1996 Act amended, still reflected a presumption that telecommunications markets were natural monopolies subject to regulation by both the FCC and state public utility commissions. The 1996 Act aimed to alter the competitive landscape of local telecommunications by requiring ILECs to unbundle various components of their local networks and make them available to potential competitors. Such unbundling requires, in effect, that incumbent local exchange carriers "share" with their competitors the inherent economies of scale built into their ubiquitous local networks.

By most accounts, network unbundling was not intended to be an end in and of itself. Rather, as in the successful *Competitive Carrier* paradigm that brought competition in the long distance industry before it, Congress reasoned that a mandatory wholesale market for local access was the most effective mechanism for entrants to grow their market and thereby warrant the construction of new local access networks by firms other than the ILECs. When these networks were constructed, so the story went, the unbundling mandates could be removed. Whether or not this "stepping stone" approach was an economically reasonable expectation was essential to the unbundling regime's success. Was there in fact a path to facilities-based entry? Probably not. The economics of self-supply of facilities-based local telephone service were not, and are not today, particularly compelling for new entrants. As explained above, the provision of telecommunication services—whether local, long distance, or otherwise—is in most cases an extremely expensive business and subject to extensive scale and density economies. Many CLECs discovered to their dismay that they could not achieve sufficient economies of scale, scope, or density to warrant even entry using unbundled elements, much less support the capital required to build and operate a facilities-based

154. J. Farrell, *Creating Local Competition*, 49 FED. COMM. L.J. 201, 213 (1996).

155. *See* Lawrence J. Spiwak, *What Hath Congress Wrought? Reorienting Economic Analysis of Telecommunications Markets After The 1996 Act*, 11 ANTITRUST MAG. 32, 32 (Spring 1997).

local exchange network for the mass market. The transition to facilities-based competition was more successful in the large business market, where the sunk facilities costs of a location-specific circuit could be justified given the relative large size of the customer's expenditures. For the mass market, entry would come from entirely new technologies operated by established firms.

Furthermore, the failure of the unbundling regime in the U.S. stemmed from the fact the system was incentive incompatible. That is, dominant firms will not facilitate the demise of their dominance without some reward. This is not an irrational concept, because no firm will ever be enthusiastic about consciously going against its own self-interests by selling its rivals their key input of production (*e.g.*, loops and switching). While the 1996 Act required the ILECs to provide such elements, the Act did little to fundamentally alter incentives.

The stale, static, highly subsidized monopolized local exchange market of the early 1990s would soon transition into a dynamic, multi-firm, multi-technology market by the turn of century. The 1996 barely mentioned Internet service or mobile wireless industry, yet these two technologies now provide over half U.S. households with local telephone service. What was possible, from a policy perspective, in a static environment was impossible in the new environment. The benefits of unbundling were diminished by technological change and consumption habits, and the costs were rising. The end was inevitable.

Given the above, are there lessons to be learned from unbundling? We believe that there are. Here are just a few:

Facilities-based entry into local markets remains very costly, and the equilibrium number of firms in many markets, especially local wireline markets, is prone to be very small absent significant technological progress. Accordingly, when either evaluating or crafting a regulatory regime, we recommend that the policymaker establish realistic expectations about the prospects for facilities-based entry. In many wireline markets, duopoly may be the best that can be achieved, but such structure may nonetheless provide excellent market performance. As such, policy should be designed accordingly.

Firms are not passive recipients of regulation, but active responders to and manipulators of it. Accordingly, when either evaluating or crafting a regulatory regime, we recommend that careful attention be paid to aligning incentives. Policymakers should not expect regulated firms to participate actively in a scheme that reduces their profits. We also recommend that enforcement be carefully considered. The regulated "transaction" should be simple enough to monitor and have a relatively low susceptibility to manipulation.

The incentive to sabotage a regulatory regime depends on numerous factors. When either evaluating or crafting a regulatory regime, we recommend that the policymaker understand the relationship between retail pricing structures, including the use and nature of subsidies, and the price of the regulated wholesale product or service offered.

Entrants will seek out profits, and thus attack first those markets that generate any implicit subsidies. Doing so promotes sabotage, and threatens the sustainability of the subsidy regime. When either evaluating or crafting a regulatory regime, subsidies should be made explicit and portable.

Intermodal competition, particularly competition from technologies not subject to heavy regulation, weakens the case for asymmetric policy interventions. Accordingly, when either evaluating or crafting a regulatory regime, we recommend that the present, near-term, and long-term prospects for intermodal competition be carefully studied, and, given the rate of technological progress in modern communications, that the prospects be overstated by a considerable degree.

Different political ideologies obviously have different views about the degree to which government should intervene in the market. Accordingly, the prospects for sustained support for major policy initiatives should be viewed as relatively weak, since what one regulator creates the next can destroy. Thus, when crafting a regulatory regime, some consideration should be given to political viewpoints. If such policies are politically sensitive, then the value of regulatory policies should be discounted accordingly.

Many regulations, including unbundling, are implemented as a strategy for static markets. In a dynamic market where investments in new networks and new technology are necessary, regulation is prone to distort and attenuate investment incentives. When crafting regulations for a dynamic market, therefore, we recommend that special care be taken, particularly at efforts to regulate price.

Finally, we recommend a healthy skepticism regarding the regulator's ability to properly balance investment incentives. In any cost-benefit analysis, which should be a formal component of any effort to evaluate regulation, there should be a substantial margin between the benefits and costs prior to establishing a regulatory regime in dynamic markets.

Without question, the data indicate that we have come a very long way from the world of local telephone monopolies selling switched access service. (If anything, ILECs are increasingly faced with stranded costs, particularly when regulation forces them to keep legacy switched-services operating.) While unbundling may have arguably been a sensible policy for the monopoly communications world of 1996, in today's competitive market the case for such hefty (and asymmetrical) interventions is exceedingly weak. Policymakers need now to focus on a designing an entirely new regulatory regime suitable for the marketplace realities of the 21st century. Hopefully, with the benefit of hindsight and lessons learned from the U.S. unbundling experience, future regulatory interventions in the communications marketplace will proceed with more humility and wisdom.

APPENDIX A: RELEVANT FCC ORDERS AND COURT CASES

In this appendix, we summarize the major orders and court decisions related to the U.S. unbundling experiment. To help ensure accuracy, this appendix draws heavily from summaries provided in FCC orders.

A. Local Competition Order

The Commission first addressed the unbundling obligations of ILECs in the *Local Competition Order*, which adopted the first set of rules designed to implement the unbundling and resale requirements of the Section 251.[156] The Commission stated that for purposes of determining whether access to a proprietary network element was "necessary" under section 251(d)(2), the term "[n]ecessary means . . . that an element is a prerequisite for competition."[157] The Commission also found that "[t]he term 'impair' means 'to make or cause to become worse; diminish in value.'"[158] The Commission determined that the "impairment" standard required "the Commission . . . to consider whether the failure of an incumbent to provide access to a network element would decrease the quality, or increase the financial or administrative cost of the service a requesting carrier seeks to offer, compared with providing that service over other unbundled elements in the incumbent LEC's network."[159]

The Commission adopted a minimum set of unbundled elements including: local loops; network interface devices; local and tandem switching capability; interoffice transmission facilities; signaling and call-related databases; operations support systems functions; and operator services and directory assistance facilities. The Commission established that the ILECs were obligated to combine elements upon request. The state commissions were free to prescribe additional elements.

In prescribing rates, state commissions were to apply the Total Element Long Run Incremental Cost (TELRIC) methodology, which was a forward-looking, long-run, incremental cost methodology. The Commission found that "the price of a network element should include the forward-looking costs that can be attributed directly to the provision of services using that element, which includes a reasonable return on investment (*i.e.*, "profit"), plus a reasonable share of the forward-looking joint and common costs."[160] As directed by statute, the Commission determined that TELRIC-

156. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, *First Report and Order*, 11 FCC Rcd 15499, 15616-775 (1996) [hereinafter *First Local Competition Order*].

157. *Id.* at para. 282.

158. *Id.* at para. 285.

159. *Id.*

160. *Id.* The Commission adopted a minimum set of unbundled elements including: "local loops, network interface devices, local and tandem switching capability, interoffice

based rates should not include embedded or historical costs, opportunity costs or universal service subsidies. The states were to use this general methodology in setting actual rates for unbundled elements.

B. Iowa Utilities Board v. FCC

On review in 1997, the Eighth Circuit vacated many of the rules adopted in the *Local Competition Order* as beyond the Commission's jurisdiction.[161] The court also vacated section 51.315(b) of the Commission's rules, which barred ILECs from separating UNEs before providing them to competitors, on the ground that "unbundled" means "not combined."[162] The court also vacated sections 51.315(c)-(f), which required ILECs to combine elements on behalf of competitive LECs on request, on the ground that section 251(c)(3) does not require ILECs to combine elements on behalf of competitive LECs, but only requires ILECs to provide elements in a manner that permits the competitive LEC to do the actual combining.[163] The court also held that section 251(c)(3) requires "unbundled access only to an ILEC's existing network—not to a yet unbuilt superior one."[164] Specifically, the Eighth Circuit explained that ILECs can be required to modify their facilities "to the extent necessary to accommodate interconnection or access to network elements," but cannot be required "to *alter substantially* their networks in order to provide *superior* quality interconnection and unbundled access."[165] Finally, the court upheld the Commission's interpretation of the "necessary" and "impair" standards.[166]

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transmission facilities, signaling and call-related databases, operations support systems functions, and operator services and directory assistance facilities". The Commission established that the ILECs were obligated to combine elements upon request. The state commissions were free to prescribe additional elements.

As for pricing these elements, the Commission established the Total Element Long Run Incremental Cost (TELRIC) methodology, which was a forward-looking, long-run, incremental cost methodology. The Commission found that "the price of a network element should include the forward-looking costs that can be attributed directly to the provision of services using that element, which includes a reasonable return on investment (*i.e.*, 'profit'), plus a reasonable share of the forward-looking joint and common costs."160. As directed by statute, the Commission determined that TELRIC-based rates should not include embedded or historical costs, opportunity costs or universal service subsidies. The states were to use this general methodology in setting actual rates for unbundled elements. 673-703.

161. *See* Iowa Utils. Bd. v. FCC, 120 F.3d 753, 800, 803, 805-06, 819 (8th Cir. 1997), *aff'd in part, rev'd in part sub nom.*, AT&T Corp. v. Iowa Utils. Bd., 525 U.S. 366 (1999)

162. *Id.* at 813.

163. *Id.*

164. *Id.*

165. *Id.* at 813, n. 33 (emphasis added) (citing to the *First Report and Order, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96–98, para. 198 (Aug. 8, 1996)).

166. *See Iowa Utils. Bd. v. FCC*, 120 F.3d at 810-12.

C. AT&T v. Iowa Utilities Board

In 1998, the U.S. Supreme Court reversed the Eighth Circuit's jurisdictional holdings, concluding that the Commission has jurisdiction to implement the local competition provisions of the 1996 Act.[167] However, the Court vacated the agency's interpretation of the "necessary" and "impair" standards, faulting the Commission for its failure to consider the availability of alternative sources of network elements.[168] The Court also concluded that "the Commission's assumption that *any* increase in cost (or decrease in quality) imposed by denial of a network element renders access to that element 'necessary,' and causes the failure to provide that element to 'impair' the entrant's ability to furnish its desired services, is simply not in accord with the ordinary and fair meaning of those terms."[169] The Court stated "that the Act requires the FCC to apply *some* limiting standard, rationally related to the goals of the Act, which it has simply failed to do."[170] The Court stated that "if Congress had wanted to give blanket access to incumbents' networks on a basis as unrestricted as the scheme the Commission has come up with, it would not have included § 251(d)(2) in the statute at all."[171] Instead, "[i]t would simply have said . . . that whatever requested element can be provided must be provided."[172] At the same time, the Court rejected the "essential facilities' doctrine" from U.S. antitrust jurisprudence as pertinent to the issue.[173] The Court found that it need not decide whether the statute requires application of that standard as a matter of law, adding "it may be that some other standard would provide an equivalent or better criterion for the limitation upon network-element availability that the statute has in mind."[174]

The Court upheld section 51.315(b) of the Commission's rules, which barred the separating of network elements already combined before providing them to a competitor if asked for in a combined form, stating that Section 251(c)(3) is "ambiguous on whether leased network elements may or must be separated, and the rule the Commission has prescribed is entirely rational, finding its basis in § 251(c)(3)'s nondiscrimination requirement."[175]

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167. AT&T v. Iowa Utils. Bd., 525 U.S. 366, 385 (1999).
168. *Id.* at 391-92.
169. *Id.* at 389-90.
170. *Id.* at 388. For an economic analysis of the Supreme Court's decision as it related to impairment, *see* Beard et al., *The Law and Economics of Unbundling and Impairment*, 2 J. L. TECH. & POL. 475, 502 (2003).
171. *AT&T v. Iowa Utils. Bd.*, 525 U.S. at 390.
172. *Id.*
173. *Id.* at 388.
174. *Id.*
175. *Id.* at 395.

D. The Commission's UNE Remand Order

In 1999, in response to the Supreme Court's decision in *Iowa Utilities Board*, the Commission re-examined its treatment of the "necessary" and "impair" standards, as well as the list of UNEs that ILECs must provide.[176] In the *UNE Remand Order*, the Commission adopted narrower requirements for determining elements that must be provided under the "necessary" and "impair" standards.[177] The agency also modified its list of required unbundled elements, expanding it in certain respects and narrowing it in others.[178] The UNE Remand Order was, in many respects, the beginning of the end of unbundling in that the Commission showed itself willing to weaken the unbundling rules in response to Court remand that did not require it to do so.

In response to the Court's decision, the Commission adopted a new definition of "impairment."[179] The Commission stated that the "ILECs' failure to provide access to a nonproprietary network element 'impairs' a requesting carrier . . . if, taking into consideration the availability of alternative elements outside the incumbent's network, including self-provisioning by a requesting carrier or acquiring an alternative from a third-party supplier, lack of access to that element *materially diminishes* a requesting carrier's ability to provide the services it seeks to offer."[180] The Commission held that the "'impair' analysis considers the cost, timeliness, quality, ubiquity, and operational issues associated with the use of an alternative."[181]

The Commission also added to its analysis factors to reflect the "at a minimum" language in Section 251(d)(2),[182] adding to the necessary and impair standard additional factors to consider, including: (1) the rapid introduction of competition in all markets—"whether the availability of an unbundled network element is likely to encourage requesting carriers to enter the local market in order to serve the greatest number of consumers as rapidly as possible[;]"[183] (2) promotion of facilities-based competition, investment and innovation—"the extent to which the unbundling obligations we adopt will encourage the development of facilities-based competition by competitive LECs, and innovation and investment by both ILECs and CLECs, especially for the provision of advanced services[;]"[184] (3) reduced

176. Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, *Third Report and Order and Fourth Further Notice of Proposed Rulemaking*, 15 FCC Rcd 3696, 3699 para. 2 (1999) [hereinafter *UNE Remand Order*].

177. *Id.* at 9-10.

178. *Id.* at 51-52.

179. *Id.* at 10.

180. *Id.* at 3704-05 (emphasis in original); *see also id.* at 3723-50 paras. 48-116.

181. *Id.* at 3705; *see also id.* at 3730-45 paras. 62-100.

182. *Id.* at 3721 para. 32.

183. *Id.* at 10.

184. *Id.*

regulation—"the extent to which we can encourage investment and innovation by reducing regulatory obligations to provide access to network elements, as alternatives to the ILECs' network elements become available in the future[;]"[185] (4) certainty in the market—"how the unbundling obligations . . . can provide the uniformity and predictability that new entrants and fledgling competitors need to develop national and regional business plans[, as well as] . . . whether the rules . . . provide financial markets with reasonable certainty so that carriers can attract the capital they need to execute their business plans to serve the greatest number of consumers[;]"[186] and (5) administrative practicality—"whether the unbundling obligations . . . are administratively practical to apply."[187]

In the end, the Commission concluded that the following network elements must be unbundled: (1) "Loops"—"including high-capacity lines, xDSL-capable loops, dark fiber, and inside wire owned by the incumbent LEC[;]" (2) "Subloops"—"unbundled access to subloops, or portions of the loop, at any accessible point[;]" (3) "Network Interface Device (NID)"—"includ[ing] all features, functions and capabilities of the facilities used to connect the loop to premises wiring, regardless of the specific mechanical design[;]" (4) "Circuit Switching"—"except for local circuit switching used to serve end users with four or more lines in access density zone 1 in the top 50 Metropolitan Statistical Areas (MSAs), provided that the incumbent LEC provides nondiscriminatory, cost-based access to the enhanced extended link throughout zone 1[;]" (5) "Packet Switching"—"only in limited circumstances in which the incumbent has placed digital loop carrier systems in the feeder section of the loop or has its Digital Subscriber Line Access Multiplexer (DSLAM) in a remote terminal[;]" (6) "Interoffice Transmission Facilities"—"dedicated interoffice transmission facilities, or transport, including dark fiber[;]"(7) shared transport—unbundled access to shared transport where unbundled local circuit switching is provided; (8) "Signaling and Call-Related Databases"—including, but not limited to "unbundled access to signaling links and signaling transfer points (STPs) in conjunction with unbundled switching, and on a stand-alone basis[,]" as well as unbundled access to call-related databases; and (9) "Operations Support System (OSS)"—"consist[ing] of pre-ordering, ordering, provisioning, maintenance and repair, billing functions supported by an ILEC's databases and information[,]" including "access to all loop qualification information contained in any of the incumbent LEC's databases or other records, including information on whether a particular loop is capable of providing advanced services."[105] Finally, the Commission established a three-year review schedule for the national list of unbundled elements (the *Triennial Review* process). In effect, the three-year schedule created a near continuous and expensive legal and regulatory battle over unbundling.

185. *Id.* at 11.
186. *Id.*
187. *Id.*

E. Availability of Enhanced Extended Links ("EELs")

The Commission subsequently modified its *UNE Remand Order* as it related to the use of unbundled elements to provide exchange access services originating and terminating long distance services.[188] Specifically, the Commission ruled that on an interim basis, "interexchange carriers (IXCs) may not convert special access services to combinations of unbundled loops and transport network elements, whether or not the IXCs self-provide entrance facilities (or obtain them from third parties)."[189] The Commission provided that this restriction would not apply "if an IXC uses combinations of unbundled network elements to provide a significant amount of local exchange service, in addition to exchange access service, to a particular customer."[190] The Commission stated that this temporary restriction on the use of EELs was consistent with its finding in the *Local Competition Order* that the Commission "may, where necessary, establish a temporary transitional mechanism to help complete all of the steps toward the pro-competitive goals of the 1996 Act, including the full implementation of a competitively-neutral system to fund universal service and a completed transition to cost-based access charges."[191]

The Commission later clarified and extended this temporary restriction on the use of EELs by defining "more precisely the 'significant amount of local exchange service' that a requesting carrier must provide in order to obtain loop-transport combinations."[192] This decision specified three safe harbors for demonstrating that a requesting carrier was providing a significant amount of local exchange service to a particular customer.[193] The Commission also clarified that "incumbent LECs must allow requesting carriers to self-certify that they are providing a significant amount of local exchange service over combinations of unbundled network elements."[194]

F. Line Sharing Order

In the *Line Sharing Order*, the Commission required ILECs, under the "impair" standard, to provide the high-frequency portion of the local loop ("HFPL") to requesting telecommunications carriers as an unbundled

188. Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, *Supplemental Order*, FCC 99-370, 15 FCC Rcd 1760 para. 1 (1999).

189. *Id*. at para. 2.

190. *Id.*

191. *Id.* at para. 7.

192. Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, *Supplemental Order Clarification*, FCC 00-183, 15 FCC Rcd. 9587 para. 21 (2000).

193. *See id.* at para 22.

194. *Id*. at para. 29.

element.[195] Certain criteria were established in order to prevent the degradation of analog voice service over such a loop. Limiting the availability of the HFPL to entrant, the Commission determined that "[i]ncumbents are not required to provide unbundled access to the high frequency portion of the loop if they are not currently providing analog voice service to the customer."[196] The Commission also required that ILECs "condition loops to enable requesting carriers to provide acceptable forms of xDSL-based services over the high frequency portion of the loop unless such conditioning would significantly degrade the incumbent's analog voice service,"[197] a rule that had the effect of increasing the number of loops for which the high-frequency portion was available.

G. Iowa Utilities Board v. FCC (Remand Decision)

In 2000, on remand after the Supreme Court's opinion in *AT&T v. Iowa Utilities Board*, the Eighth Circuit reviewed several more aspects of the *Local Competition Order*.[198] The court vacated on the merits the Commission's rule setting out the TELRIC pricing methodology, concluding that costs based on this "hypothetical" network did not reflect the "cost . . . of providing the interconnection or network element" as required by section 252(d)(1)(A)(i).[199] The Court did, however, permit the Commission to rely on forward-looking cost, rather than historical cost, and established that the cost of the element should not include any costs of universal service subsidies.[200] The court also reaffirmed its earlier decision to vacate the Commission's new combinations rules of sections 51.315(c)-(f).[201]

H. Verizon v. FCC

In 2002, the Supreme Court upheld the TELRIC standard established by the Commission in the *Local Competition Order*.[202] In so doing, the Court overturned the decision by the Eighth Circuit concerning the lawfulness of

195. Deployment of Wireline Services Offering Advanced Telecommunications Capability and Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, *Third Report and Order, and Fourth Report and Order*, FCC 99-355,14 FCC Rcd. 20912, 20917-19 (1999) [hereinafter *Line Sharing Order*].

196. *Id.*

197. *Id.*

198. Iowa Utils. Bd. v. FCC, 219 F.3d 744 (8th Cir. 2000).

199. *Id.* at 750.

200. *See id.* at 753.

201. *See id.* at 759.

202. Verizon Comm'ns Inc. v. FCC, 535 U.S. 467, 523(2002) ("We cannot say whether the passage of time will show competition prompted by TELRIC to be an illusion, but TELRIC appears to be a reasonable policy for now, and that is all that counts. The incumbents have failed to show that TELRIC is unreasonable on its own terms.") (citations omitted).

the TELRIC.[203] The Court specifically rejected the argument that rates for unbundled elements must be based on the historic cost;[204] affirmed the Commission's decision to base TELRIC on the use of the most efficient telecommunications technology currently available and the lowest cost network configuration in light of the existing location of the incumbent's wire centers;[205] and rejected the claim that TELRIC is an unreasonable rate making methodology for elements because it does not produce facilities-based competition.[206] Furthermore, the Court upheld the Commission's rules requiring that ILECs combine elements in certain circumstances even if they are not combined in the incumbent's network, concluding that rules "reflect a reasonable reading of the statute, meant to remove practical barriers to competitive entry into local-exchange markets while avoiding serious interference with incumbent network operations."[207]

I. United States Telecom Association v. FCC (USTA I)

In 2002, eleven days after the Supreme Court's decision in *Verizon*, the District of Columbia Circuit vacated and remanded for further consideration the portions of the Commission's *UNE Remand Order* that adopted an interpretation of the "impair" standard and established a list of mandatory UNEs, and vacated and remanded as well the Commission's order requiring that the high-frequency portion of the loop be made available as an unbundled element.[208] In doing so, the District of Columbia Circuit criticized what it characterized as the decision in the *UNE Remand Order* "to adopt a uniform national rule, mandating [an] element's unbundling in every geographic market and customer class, without regard to the state of competitive impairment in any particular market."[209] The Court concluded that, under this approach, "UNEs will be available to CLECs in many markets where there is no reasonable basis for thinking that competition is suffering from any impairment of a sort that might have [been] the object of Congress's concern."[210] The question of subsidies were central to the Court's decision. The Court stated that "[o]ne reason for such market-specific variations in competitive impairment is the cross-subsidization often ordered by state regulatory commissions . . . [which] usually brings about undercharges for some subscribers (usually rural and/or residential) and

203. *See id.* ("[R]evers[ing] the Eighth Circuit's judgment insofar as it invalidated TELRIC as a method for setting rates under the Act.").

204. *See id.* at 513.

205. *See id.* at 503.

206. *See id.* at 516.

207. *Id.* at 535.

208. *See* United States Telecom Ass'n v. FCC, 290 F.3d 415, 417 (D.C. Cir. 2002) (*USTA I*) ("[G]rant[ing] both petitions, and remand[ing] both rules to the Commission.").

209. *Id.* at 422.

210. *Id.*

overcharges for the others (usually urban and/or business),"[211] and concluded that "the Commission nowhere appears to have considered the advantage CLECs enjoy in being free of any duty to provide underpriced service to rural and/or residential customers and thus of any need to make up the difference elsewhere."[212] The Court also concluded that the Commission had failed to adequately explain how a uniform national rule would help to achieve the goals of the Act, such as the rapid introduction of competition, promotion of facilities-based competition, investment and innovation, certainty in the market place, administrative practicality and reduced regulation.[213]

On impairment, the court found that the *UNE Remand Order* improperly "reflect[s] an open-ended notion of what kinds of cost disparity are relevant" for purposes of identifying impairment.[214] In particular, the court stated that "[t]o rely on cost disparities that are universal as between new entrants and incumbents in *any* industry is to invoke a concept too broad, even in support of an *initial* mandate, to be reasonably linked to the purpose of the Act's unbundling provisions."[215] Instead, the Court advised the FCC to balance both the benefits and costs of unbundling, concluding that "[a] cost disparity approach that links 'impairment' to universal characteristics, rather than ones linked in (in some degree) to natural monopoly, can hardly be said to strike such a balance."[216] Finally, the court vacated the Commission's *Line Sharing Order*, finding that the Commission had failed to give adequate consideration to existing facilities-based competition.[217]

J. Competitive Telecommunications Association v. FCC

In 2002, a few months after the D.C. Circuit's decision in *USTA I*, the District of Columbia Circuit upheld the FCC's interim restrictions on the availability of enhanced extended links (EEL).[218] The Court held that the FCC has authority to restrict the availability of UNEs to particular services for which there has been a showing that denial of the requested element would impair the competitor's ability to provide the service.[219]

211. *Id*.
212. *Id*. at 423.
213. *See id*. at 436-39.
214. *Id*. at 426.
215. *Id.* at 427 (emphasis in original).
216. *Id.*
217. *Id.* at 428-29.
218. *See* Competitive Telecomm. Ass'n v. FCC, 309 F.3d 8, 18 (D.C. Cir. 2002) (holding that "on the present record [the Court is] plainly unable to say that the restriction on commingling is arbitrary and capricious").
219. *See id*. at 12-14.

K. Triennial Review Order

In August 2003, the FCC released the *Triennial Review Order*, in which it, once more, reinterpreted the "impair" standard and revised the list of unbundled elements.[220] This time, the FCC declared that a requesting carrier is impaired "when lack of access to an incumbent LEC network element poses a barrier or barriers to entry, including operational and economic barriers, which are likely to make entry into a market uneconomic."[221] The FCC's new impairment analysis accounted for intermodal alternatives, self-provisioning of network elements, and the potential ability of a requesting carrier to obtain similar facilities from a third party.[222] The relevant structural barriers the Commission considered included: (1) economies of scale; (2) sunk costs; (3) first-mover advantages; (4) absolute cost advantages; and (5) barriers within the control of the incumbent.[223] The Commission also considered such factors as customer class, geography, the nature of the service provided, and the types and capacities of the facilities involved in a requesting carrier's service offering.[224] In order to implement the new standard, the FCC adopted a set of triggers for the states to apply to determine the extent of actual and potential deployment. Significantly, in order to encourage new fiber deployment, under a new policy that became colloquially known as "new wires/new rules," the FCC stated that ILECs did not have to offer unbundled access to newly deployed or "greenfield" fiber loops or to the packet-switched features, functions and capabilities of hybrid copper/fiber loops.[225]

L. United States Telecom Association v. FCC (USTA II)

Various parties appealed the *Triennial Review Order*, and, on March 2, 2004, the District of Columbia Circuit decided *USTA II*.[226] *USTA II* upheld the *Triennial Review Order* but only in part. The District of Columbia Circuit upheld the FCC'S network modification requirements; its determinations regarding Section 271 access, pricing, and combination obligations; its EEL eligibility criteria; its determination, with certain exceptions, not to require

220. Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers; Implementation of the Local Competition Provisions of the Telecommunications Act of 1996; Deployment of Wireline Services Offering Advanced Telecommunications Capability, *Report and Order and Order on Remand and Further Notice of Proposed Rulemaking*, 18 FCC Rcd 16978 para. 7 (2003), *vacated and remanded in part, affirmed in part*, United States Telecom Ass'n v. FCC, 359 F.3d 554 (D.C. Cir. 2004) (*USTA II*). (setting forth the executive summary).

221. *See id.* at para. 84.

222. *See id.*

223. *See id.* at para. 7.

224. *See id.*

225. *Id.* at para. 272 *et seq.*

226. United States Telecom Ass'n v. FCC, 359 F.3d 554 (D.C. Cir. 2004) (*USTA II*).

unbundling of FTTH loops, broadband hybrid loops, enterprise switching, and most ILEC databases; and its decision not to unbundle the high frequency portion of the loop. On impairment, the D.C. Circuit concluded that the Commission's impairment test now "explicitly and plausibly connects factors to consider in the impairment inquiry to the natural monopoly characteristics. . . [or] to other structural impediments to competitive supply."[227] The *USTA II* court also upheld the Commission's authority to take costs into account in its unbundling analysis.[228]

In a blow to the trigger approach, the *USTA II* court vacated the Commission's "sub-delegation" of authority to state commissions.[229] The Commission's nationwide impairment finding for unbundled switching (and dedicated transport), the source for the vast majority of competition from unbundled elements, was vacated and remanded, setting the stage for the end of the switching element.

M. Triennial Review Remand Order

After a protracted political fight, the Bush Administration decided not to appeal *USTA II* to the Supreme Court.[230] The Court denied *certiorari* of *USTA II* in 2004, leaving the *USTA II* court ruling as the law of the land.[231] Realizing that the protracted legal battle to develop a viable paradigm for the "necessary and impair" standard was finally over, the FCC issued an *Order on Remand* in 2005 which effectively ended the nearly ten-year U.S. experiment with unbundling.[232] In the *Triennial Review Remand Order*, the FCC stated that it would retain the unbundling framework it adopted in the *Triennial Review Order*, but "clarif[ied]" the impairment standard in one respect and "modif[ied]" its unbundling framework in three respects.[233]

First, the FCC "clarif[ied] that when evaluating whether lack of access to an ILEC network element "'poses a barrier . . . that [is] likely to

227. *Id*. at 571-72.

228. *See id*. at 572 (holding that "there is no statutory offense in the Commission's decision to adopt a standard that treats impairment as a continuous rather than as a dichotomous variable, and potentially reaches beyond natural monopoly, but then to examine the full context before ordering unbundling").

229. *See id.* at 566.

230. *See* FCC, *Office of Solicitor General Will Not Appeal DC Circuit Decision* (June 9, 2004), https://apps.fcc.gov/edocs_public/attachmatch/DOC-248220A1.pdf; *see also* Press Release, Dep't of Commerce & NTIA, Press Release, Statement by Acting NTIA Administrator Michael D. Gallagher on Solicitor General's Decision not to Appeal DC Circuit Court Decision (June 9, 2004),
http://www.ntia.doc.gov/legacy/ntiahome/press/2004/mdgstatement_06092004.htm.

231. United States Telecom Ass'n v. FCC, 359 F.3d 554 (D.C. Cir.) (*USTA II*).

232. *See generally* Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, *Order on Remand*, 20 FCC Rcd 2533 (2005) [hereinafter *Triennial Review Remand Order*].

233. *See id.* at para. 5.

make entry into a market uneconomic,' [the FCC] make[s] that determination with regard to a reasonably efficient competitor." [234]

Second, in response to the *USTA II* court's directive, the agency modified its approach regarding carriers' unbundled access to ILECs' network elements for certain services, setting aside the *Triennial Review Order*'s "qualifying service" interpretation of section 251(d)(2), but nevertheless prohibiting the use of unbundled elements exclusively for the provision of telecommunications services in sufficiently competitive markets.[235]

Third, to the extent that the agency evaluates whether requesting carriers can compete without unbundled access to particular network elements, the FCC would "endeavor," as instructed by the D.C. Circuit, to draw reasonable inferences regarding the prospects for competition in one geographic market from the state of competition in other, similar markets.[236]

Fourth, as directed by *USTA II*, the FCC would consider the appropriate role of tariffed ILEC services in our unbundling framework.[237] To this end, the FCC determined that in the context of the local exchange markets, a rule prohibiting access to UNEs when a requesting carrier is able to compete using an incumbent's tariffed offering would be inappropriate.[238]

While the *Order on Remand* goes into great detail about which elements should be made available and which should not, perhaps the most significant decision was the FCC's decision to eliminate switching from the list of UNEs that an incumbent must make available at TELRIC pricing,[239] thus effectively driving a stake through the economic heart of many CLEC's business models. According to the FCC,

> Based on the evidence of deployment and use of circuit switches, packet switches, and softswitches, and changes in incumbent LEC hot cut processes, we determine not only that competitive LECs are not impaired in the deployment of switches, but that it is feasible for competitive LECs to use competitively deployed switches to serve mass market customers throughout the nation. Further, regardless of any potential impairment that may still exist, we exercise our "at a minimum" authority and conclude that the disincentives to investment posed by the availability of unbundled switching, in

234. *See id*. at para. 22 (discussing *Triennial Review Order*, 18 FCC Rcd 17035, para. 84).

235. *See id.* (discussing *USTA II*, 359 F.3d at 591-92).

236. *See id*.

237. *See id*.

238. *See id.*

239. *Triennial Review Remand Order*, 20 FCC Rcd at para. 204.

> combination with unbundled loops and shared transport, justify a nationwide bar on such unbundling.[240]

While the elimination of mass market switch arguably was a significant overreach by the FCC—particularly given that the 1996 Act made it clear that ILECs would not be allowed into the long-distance business unless they made available "local switching unbundled from transport, local loop transmission or other services"[241]—the D.C. Circuit in nonetheless upheld the Commission in *Covad v. FCC*.[242] And, with the FCC's decision to eliminate unbundled switching, any business case based upon UNE-P was eviscerated. The unbundling experiment of the Telecommunications Act of 1996, for the most part, was over.

240. *Id.*
241. *See* 47 U.S.C. § 271(c)(2)(B)(vi).
242. Covad v. FCC, 450 F.3d 528 (D.C. Cir. 2006).